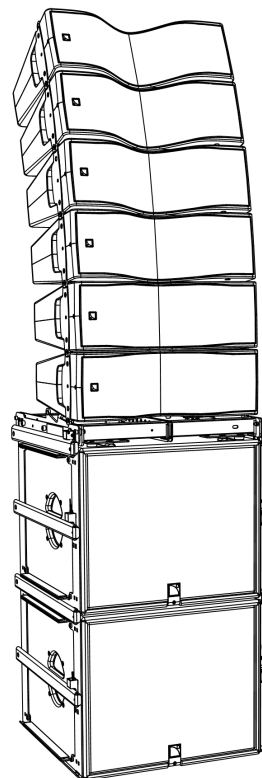
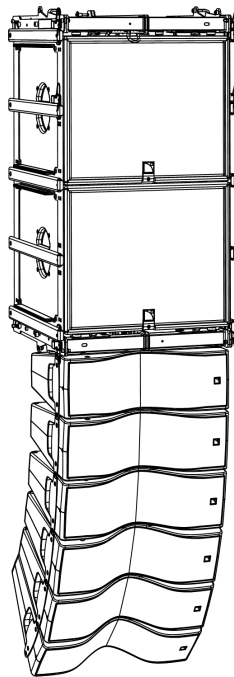
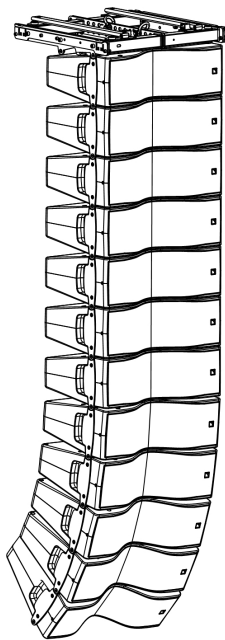


KIVA



owner's manual (EN)



Document reference: Kiva owner's manual (EN) version 1.0

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Safety

Instructions



Inspect the system before any deployment.

Perform safety related checks and inspections before any deployment.

Perform preventive maintenance at least once a year.

Refer to the preventive maintenance section for a list of actions and their periodicity.

Insufficient upkeep of the product can void the warranty.

If any safety issue is detected during inspection, do not use the product before performing corrective maintenance.

Check for issues. A rigging system part or fastener is missing or loose. A rigging system part exhibits: bends, breaks, broken parts, corrosion, cracks, cracks in welded joints, deformation, denting, wear, holes. A safety cue or label is missing. A loose part is not adequately secured.



Never incorporate equipment or accessories not approved by L-Acoustics.

Read all the related PRODUCT INFORMATION documents shipped with the products before exploiting the system.



Do not store the product on an unstable cart, stand, tripod, bracket, or table.



Beware of sound levels.

Do not stay within close proximity of loudspeakers in operation.

Loudspeaker systems are capable of producing very high sound pressure levels (SPL) which can instantaneously lead to permanent hearing damage to performers, production crew and audience members. Hearing damage can also occur at moderate level with prolonged exposure to sound.

Check the applicable laws and regulations relating to maximum sound levels and exposure times.



Work with qualified personnel for rigging the system

Installation should only be carried out by qualified personnel that are familiar with the rigging techniques and safety recommendations outlined in this manual.

Ensure personnel health and safety

During installation and set-up personnel must wear protective headgear and footwear at all times. Under no circumstances is personnel allowed to climb on a loudspeaker assembly.

Respect the Working Load Limit (WLL) of third party equipment.

L-Acoustics is not responsible for any rigging equipment and accessories provided by third party manufacturers.

Verify that the Working Load Limit (WLL) of the suspension points, chain hoists and all additional hardware rigging accessories is respected.

Respect the maximum configurations and the recommended safety precautions.

For safety issue, respect the maximum configurations outlined in this manual. To check the conformity of any configuration in regards with the safety precautions recommended by L-Acoustics, model the system in Soundvision and refer to the warnings in Mechanical Data section.

Be cautious when flying a loudspeaker configuration.

Always verify that no one is standing underneath the loudspeaker array when it is being raised. As the array is being raised, check each individual element to make sure that it is securely fastened to the adjacent element. Never leave the array unattended during the installation process.

As a general rule, L-Acoustics recommends the use of safety slings at all times.

Be cautious when ground-stacking a loudspeaker array.

Do not stack the loudspeaker array on unstable ground or surface. If the array is stacked on a structure, platform, or stage, always check that the latter can support the total weight of the array.

As a general rule, L-Acoustics recommends the use of safety straps at all times.

Risk of falling objects

Verify that no unattached items remain on the array.

Risk of tipping

Remove all rigging accessories before transporting an array.

Take into account the wind effects on dynamic load.

When a loudspeaker assembly is deployed in an open air environment, wind can produce dynamic stress to the rigging components and suspension points.

If the wind force exceeds 6 bft (Beaufort scale), lower down and/or secure the loudspeaker array.

**Intended use**

This system is intended for use by trained personnel for professional applications.

**Read the USER MANUAL before operating the system.**

Use the loudspeaker system components described in the user manual and follow the operating instructions.

Read the RIGGING MANUAL before installing the system.

Use the rigging accessories described in the rigging manual and follow the associated procedures.

Read the maintenance section of this document before servicing the product.**Do not expose the product to extreme conditions.**

Do not expose the product to rain or sea spray.

Do not expose the product to moisture (mist, steam, humidity, condensation...) or excessive heat (direct sun, radiator...) for a long period of time.

**Contact L-Acoustics for advanced maintenance.**

Any unauthorized maintenance operation will void the product warranty.

Symbols

The following symbols are used in this document:



This symbol indicates a potential risk of harm to an individual or damage to the product.

It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.



This symbol notifies the user about instructions that must be strictly followed to ensure proper installation or operation of the product.



This symbol notifies the user about complementary information or optional instructions.

Introduction

How to use this manual

The Kiva owner's manual contains information about preventive and corrective maintenance of the Kiva system. It is intended to be used together with the Kiva system rigging manuals and user manuals.



Preventive maintenance

Inspect the system before any deployment.
Perform preventive maintenance at least once a year.
Refer to [Inspection and preventive maintenance](#) (p.12).



The [Corrective maintenance](#) (p.36) section contains the operations authorized for the end user.
Performing another operation exposes to hazardous situations.
For advanced maintenance, contact your L-Acoustics representative.

As part of a continuous evolution of techniques and standards, L-Acoustics reserves the right to change the specifications of its products and the content of its document without prior notice. Please check www.l-acoustics.com on a regular basis to download the latest document and software updates.

Contact information

For information on advanced corrective maintenance:

- contact your Certified Provider or your L-Acoustics representative
- for Certified Providers, contact the L-Acoustics customer service: customer.service@l-acoustics.com

System components

Loudspeaker enclosures

Kiva	2-way passive ultra compact WST® enclosure
SB15m	High power compact subwoofer : 1 x 15"
SB18	High power compact subwoofer: 1 x 18"
SB18i	High power compact subwoofer: 1 x 18" installation version
SB18m	High power compact subwoofer: 1 x 18"

Powering and driving system

LA4X / LA8 / LA12X Amplified controller with DSP, preset library and networking capabilities



Refer to the LA4X / LA8 / LA12X user manual for operating instructions.

Loudspeaker cables

SP cables	4-point speakON loudspeaker cables (4 mm ² gauge) SP cables come in four sizes: SP.7 (0.7 m/2.3 ft), SP5 (5 m/16.4 ft), SP10 (10 m/32.8 ft) and SP25 (25 m/82 ft)
SP-Y1	breakout cable for two passive enclosures (2.5 mm ² gauge) provided with a CC4FP adapter 4-point speakON to 2 x 2-point speakON
DO	8-point PA-COM loudspeaker cables (4 mm ² gauge) DO cables come in three sizes: DO.7 (0.7 m/2.3 ft), DO10 (10 m/32.8 ft) and DO25 (25 m/82 ft)
DOSUB-LA8	breakout cable for four passive enclosures (4 mm ² gauge) 8-point PA-COM to 4 x 2-point speakON



Information about the connection of the enclosures to the LA amplified controllers is given in this document.

Refer to the LA4X / LA8 / LA12X user manual for detailed instructions about the whole cabling scheme, including modulation cables and network.

Rigging elements

KIBU-SB	Rigging frame for flying or stacking KIVA II/KIVA and SB15m
KIET	Rigging element for a maximum of 2 KIVA (ceiling or pole-mount)
KIBU	Rigging & stacking element for KIVA
CLAMP250	Clamp certified for 250 kg

Software applications

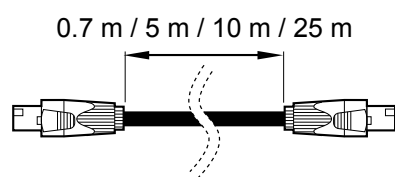
Soundvision	3D acoustical and mechanical modeling software
LA Network Manager	Software for remote control and monitoring of amplified controllers



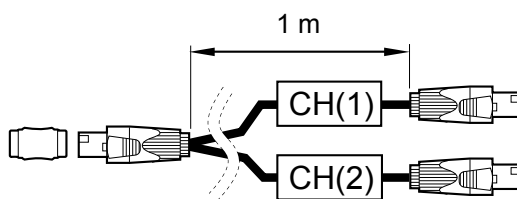
Refer to the **Soundvision** help.

Refer to the **LA Network Manager** help.

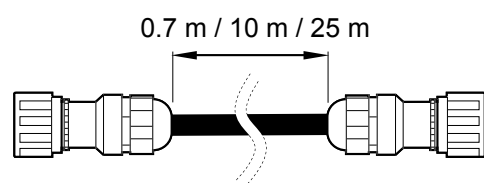
Loudspeaker cables



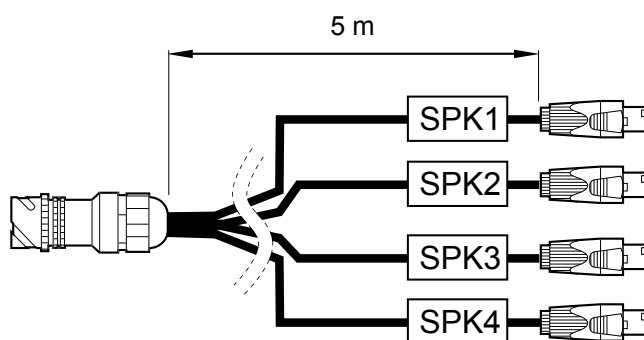
SP.7 / SP5 / SP10 / SP25



SP-Y1

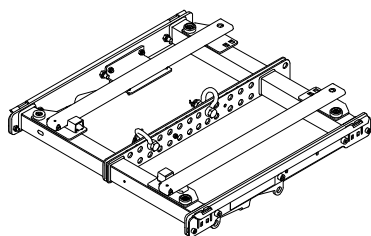


DO.7 / DO10 / DO25

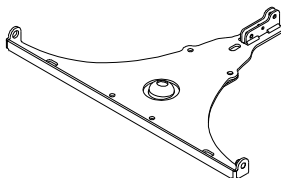


DOSUB-LA8

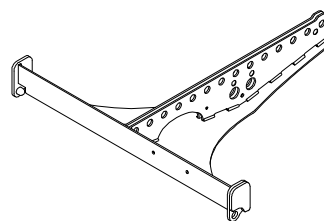
Rigging elements



KIBU-SB



KIET



KIBU

Mechanical safety

Flown configurations

The Kiva rigging system complies with 2006/42/EC: Machinery Directive. It has been designed following the guidelines of BGV-C1.

2006/42/EC: Machinery Directive specifies a safety factor of 4 against the rupture. The flown deployments described in this manual achieve a safety factor of **4 or higher**.

Refer to Soundvision for the safety factor of a specific deployment.

The **safe limit** gives the maximum number of elements for which the safety factor is compliant with the 2006/42/EC: Machinery Directive, within the use defined in this manual and regardless of the other deployment parameters (site angles, inter-enclosure angles, etc.).

The **maximum limit** gives the maximum number of elements for which the safety factor can be compliant with the 2006/42/EC: Machinery Directive, when the other deployment parameters provide the best mechanical conditions.

For mixed arrays refer to your Soundvision model.

Kiva

configuration	rigging accessory	safe limit	maximum limit
flown	KIBU-SB	8	20
flown	KIBU	8	20
ceiling-mounted	KIET	2	

SB15m

configuration	rigging accessory	maximum / Safe limit
flown	KIBU-SB	8

Other configurations

For other configurations, respect the recommended maximum limit for optimal stability.

Kiva

configuration	rigging accessory	safe limit	maximum limit
stacked	KIBU-SB	4	9
pole-mounted	KIET + 35 mm pole	2	
pole-mounted	KIET + 35 mm pole + SB15m	2	

SB15m

configuration	rigging accessory	maximum / safe limit
ground-stacked	no rigging accessory	4

SB18 / SB18i / SB18m

configuration	rigging accessory	maximum / safe limit
ground-stacked	no rigging accessory	4

Assessing mechanical safety



Mechanical safety of the rigging system

Before any installation, always model the system in Soundvision and check the **Mechanical Data** section for any stress warning or stability warning.

In order to assess the actual safety of any array configuration before implementation, refer to the following warnings:



Rated working load limit (WLL) is not enough

The rated WLL is an indication of the element resistance to tensile stress. For complex mechanical systems such as loudspeaker arrays, WLLs cannot be used per se to determine the maximum number of enclosures within an array or to assess the safety of a specific array configuration.

Mechanical modeling with Soundvision

The working load applied to each linking point, along with the corresponding safety factor, will depend on numerous variables linked to the composition of the array (type and number of enclosures, splay angles) and the implementation of the flying or stacking structure (number and location of flying points, site angle). This cannot be determined without the complex mechanical modeling and calculation offered by Soundvision.

Assessing the safety with Soundvision

The overall safety factor of a specific mechanical configuration always corresponds to the lowest safety factor among all the linking points. Always model the system configuration with the Soundvision software and check the **Mechanical Data** section to identify the weakest link and its corresponding working load. By default, a stress warning will appear when the mechanical safety goes beyond the recommended safety level.

Safety of ground-stacked arrays in Soundvision

For ground-stacked arrays, a distinct stability warning is implemented in Soundvision. It indicates a tipping hazard when the array is not secured to the ground, stage or platform. It is the user's responsibility to secure the array and to ignore the warning.

Additional safety for flown arrays

When flying an array, use available holes to implement a secondary safety.

Considerations must be given to unusual conditions

Soundvision calculations are based on usual environmental conditions. A higher safety factor is recommended with factors such as extreme high or low temperatures, strong wind, prolonged exposition to salt water, etc. Always consult a rigging specialist to adopt safety practices adapted to such a situation.

Inspection and preventive maintenance

How to do preventive maintenance

Inspect the system before any deployment and after any corrective maintenance operation.

Perform preventive maintenance at least once a year.

Refer to the maintenance manuals for advanced maintenance.

Rigging and hardware

Refer to the [Mechanical system overview](#) (p.12) to identify critical parts of the system.

Perform the [Rigging part inspection](#) (p.18) on each part using the [Inspection references](#) (p.19).

Do the [Rigging check](#) (p.26).

Acoustics



Perform the [Enclosure check](#) (p.28).

Perform the [Listening test](#) (p.30) to detect any degradation in sound quality.

Mechanical system overview

Critical parts of the lifting chains are highlighted.



The  indicates a visual inspection. The  indicates a functional check.



Perform the [Rigging part inspection](#) (p.18) on critical parts.

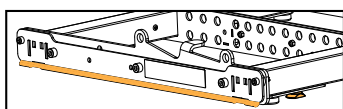
For each part, use the inspection references indicated over the preview illustration.

Mixed Kiva array with SB15m and KIBU-SB

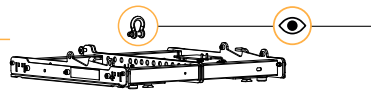
Refer to [Rigging part inspection](#) (p.18).



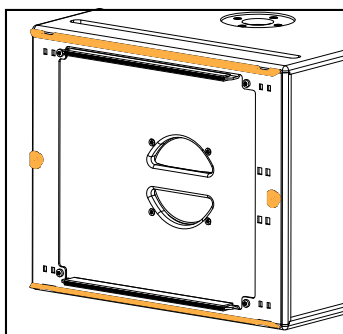
[Rigging rails, storage pins](#) (p.22)



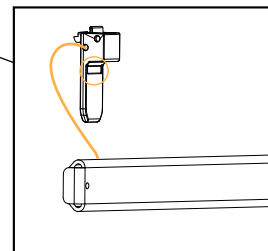
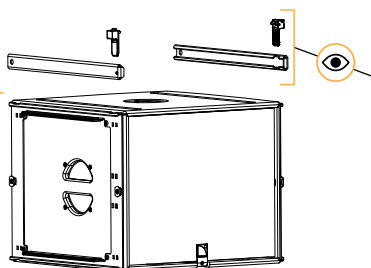
[Shackles](#) (p.24)



[Rigging rails, storage pins](#) (p.22)

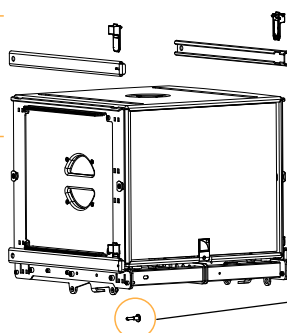
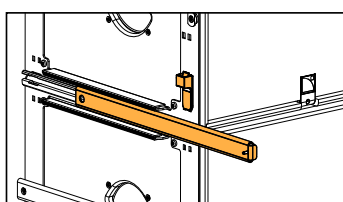


[Coupling bars, locking tabs](#) (p.19)

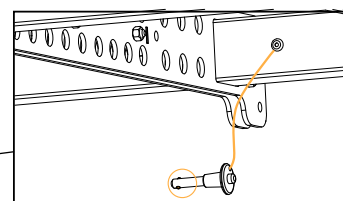


Check that the ground runners screws are tightened.

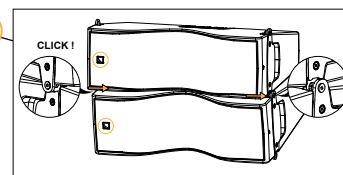
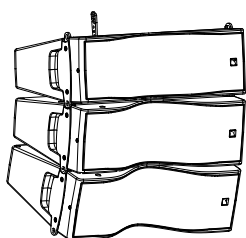
[Coupling bars, locking tabs](#) (p.19)



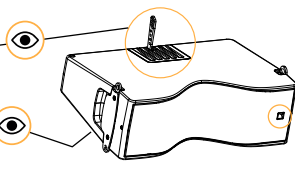
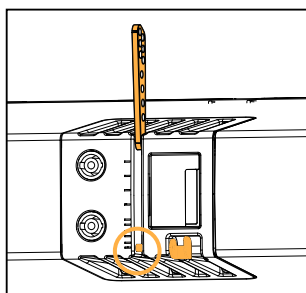
[Ball-locking pins](#) (p.20)



[Rigging check](#) (p.26)

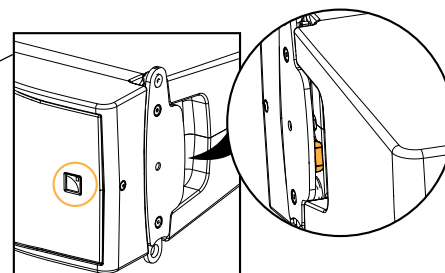


[Back cover inspection](#) (p.25)



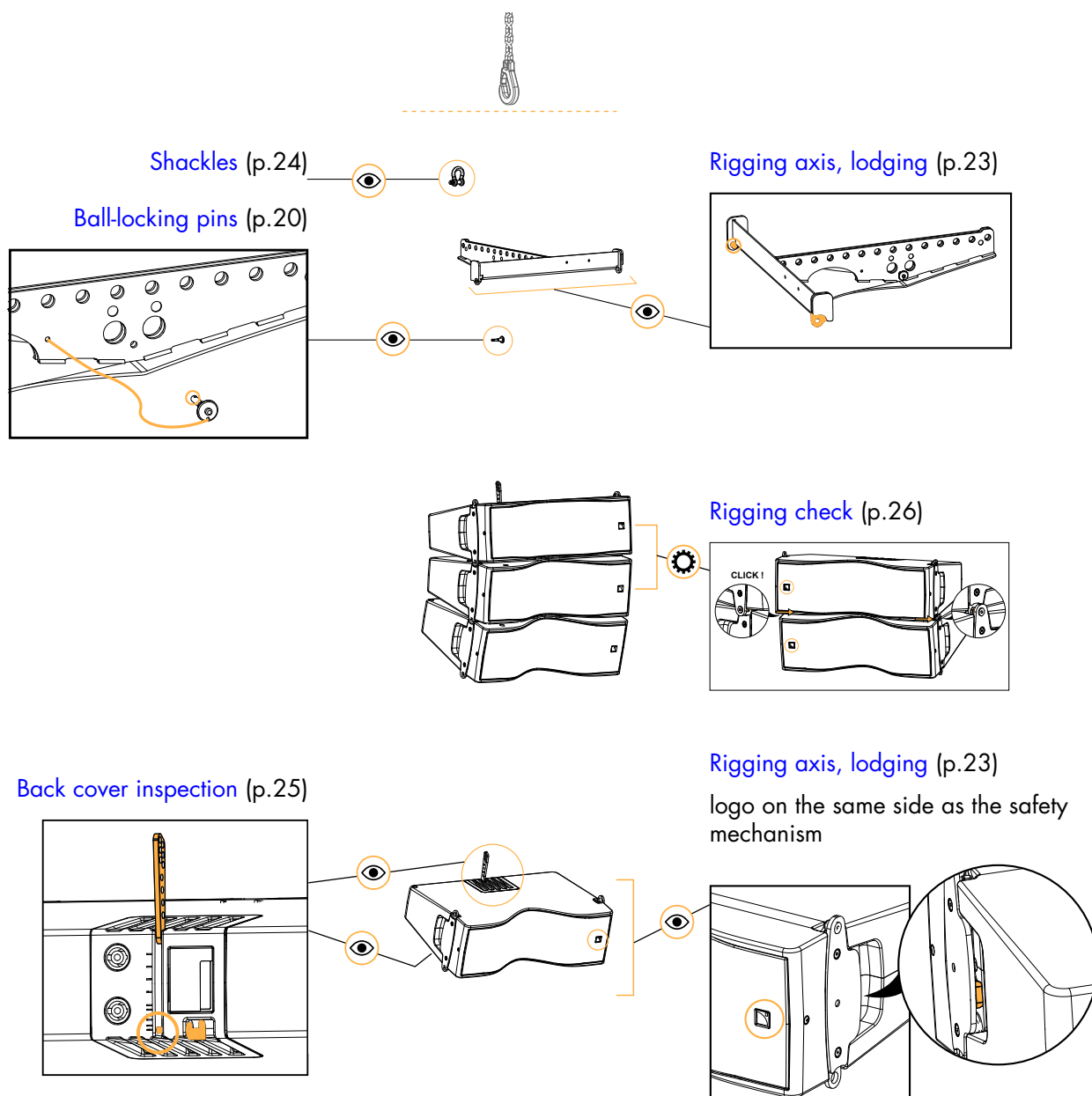
[Rigging axis, lodging](#) (p.23)

logo on the same side as the safety mechanism



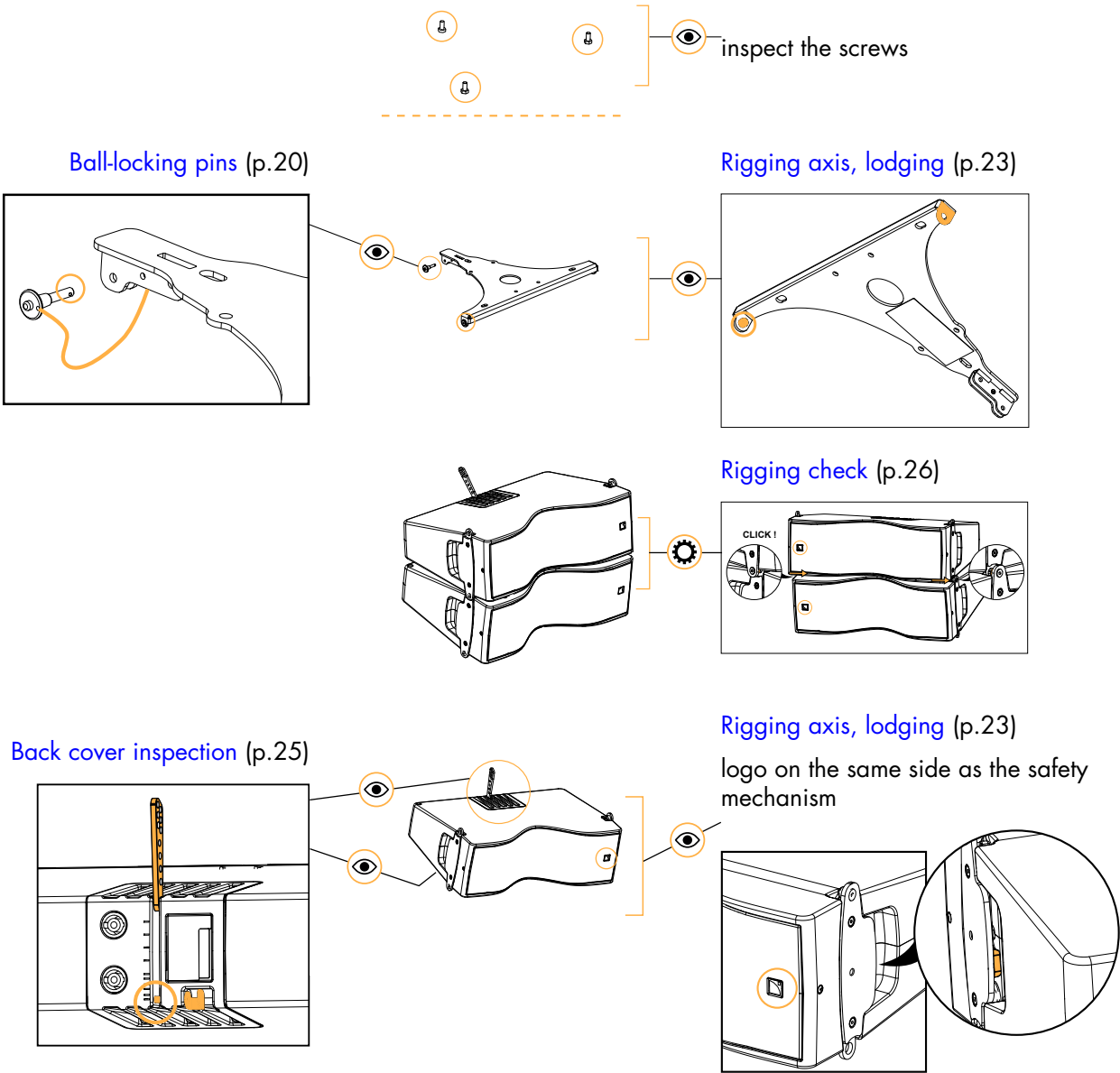
Kiva array with KIBU

Refer to [Rigging part inspection](#) (p.18).



Kiva ceiling-mounted with KIET

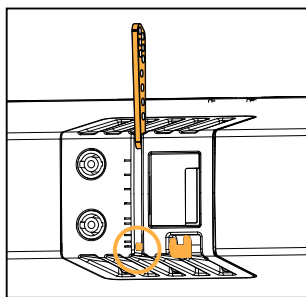
Refer to [Rigging part inspection](#) (p.18).



Kiva pole-mounted on SB15m with KIET

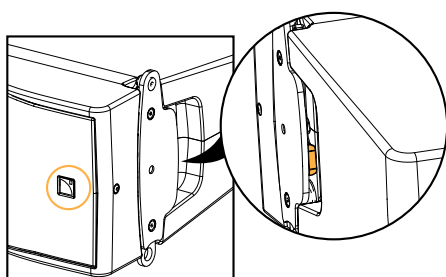
Refer to [Rigging part inspection](#) (p.18).

[Back cover inspection](#) (p.25)

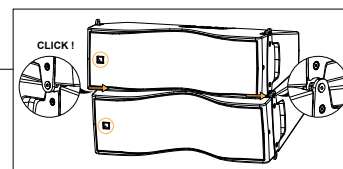


[Rigging axis, lodging](#) (p.23)

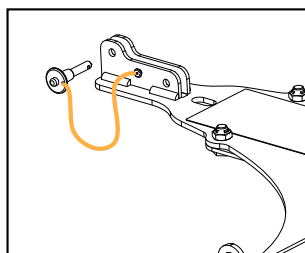
logo on the same side as the safety mechanism



[Rigging check](#) (p.26)

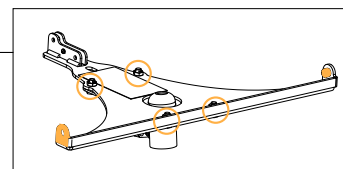


[Ball-locking pins](#) (p.20)

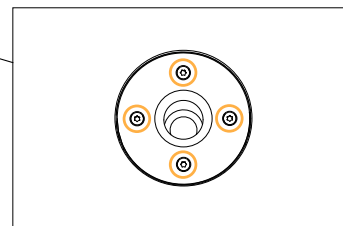
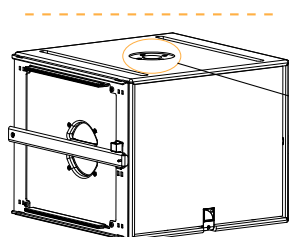


[Rigging axis, lodging](#) (p.23)

screws are tightened



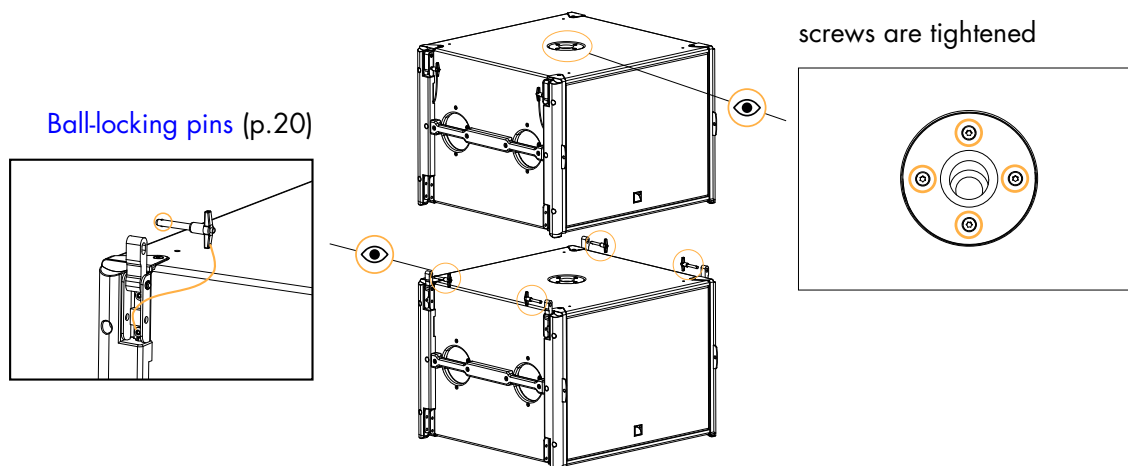
screws are tightened



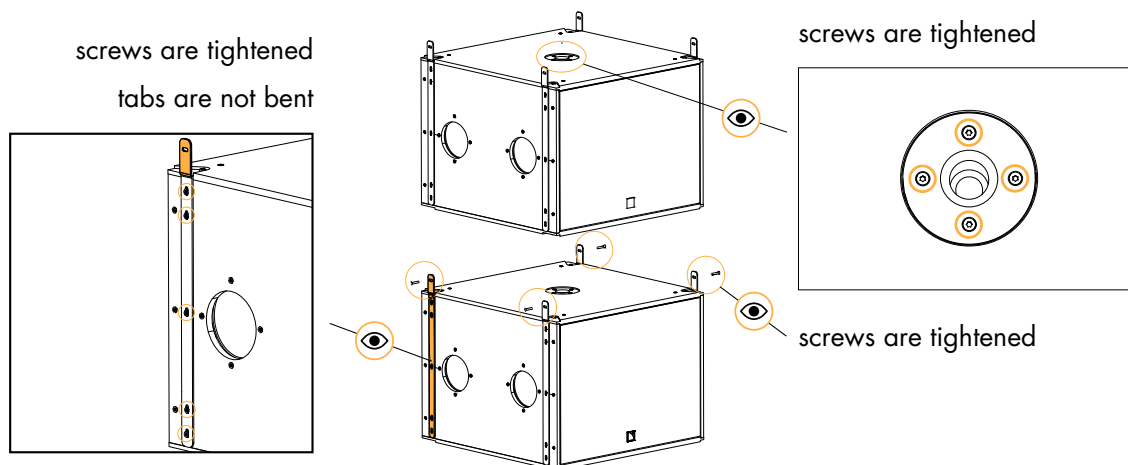
SB18 / SB18i / SB18m stacked

Refer to [Rigging part inspection](#) (p.18).

SB18

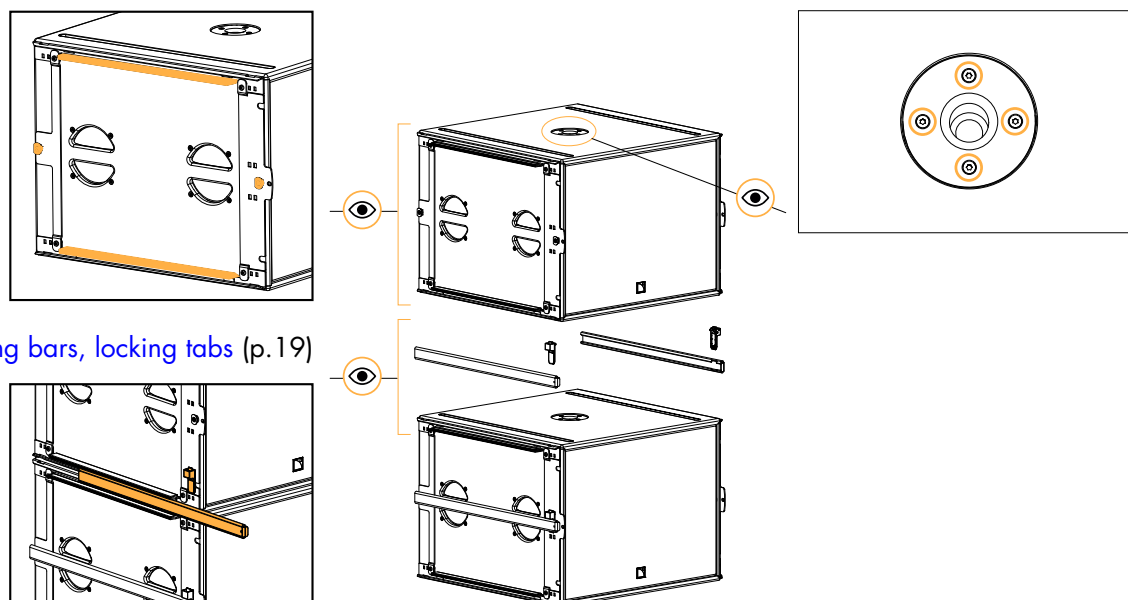


SB18i



SB18m

[Rigging rails, storage pins](#) (p.22)



Rigging part inspection

About this task

For each rigging part, use the [Inspection references](#) (p.19) for comparison and specific manipulations.

Prerequisite

Perform the inspection in a well-lit environment.

Procedure

1. Check that the rigging part is present.
2. If applicable, disassemble the rigging part from the enclosure or the rigging accessory.

Check that the tethers are intact and safely secured.

3. Inspect the part from every side.

Compare with the **reference pictures**.

Check for:

- corrosion
- wear and cracks
- bends and dents
- holes
- missing safety cues
- missing or loose fasteners



Replacing screws

If a screw is loose, remove and replace it.

Always use the new screws provided in the KR.

If no new screw is available, add blue threadlocker before reusing the screw.

Do not apply more than the indicated torque.

4. Check the **geometry** of the part to identify critical deformations.

Place the rigging part on a flat surface or hold a level against it.

5. Check the **moving parts**.

Make sure that the mechanism engages correctly.

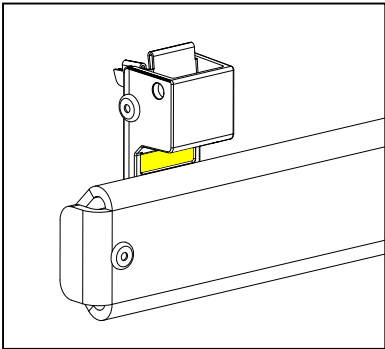
What to do next

If a problem is detected, perform the authorized maintenance operations or contact your L-Acoustics representative.

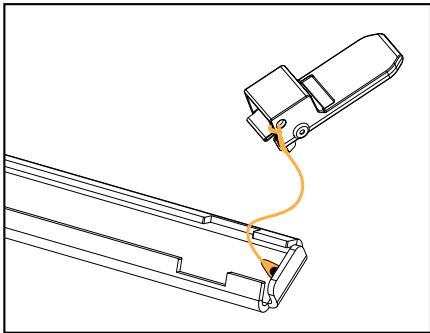
Inspection references

Coupling bars and locking tabs

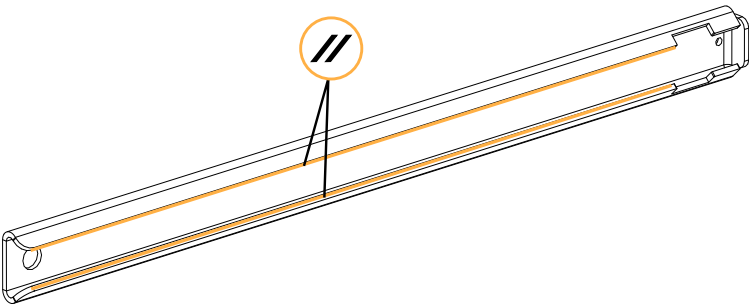
Reference pictures



safety cue



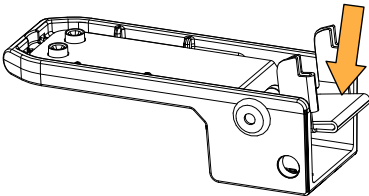
tether



geometry

Moving parts

The tab returns to its initial position upon release.



Repair kits (KR)

Coupling bars

KIBU-SB	KR SB15MRIG (Kit SB15M 2 coupling bars)
SB15m	KR SB15MRIG (Kit SB15M 2 coupling bars)
SB18m	KR SB18MRIG (Kit SB18M 2 coupling bars)

[Locking tabs](#) (p.69)

[Locking tabs](#) (p.69)

*

Locking tabs

KIBU-SB	KR WIFOVER (Kit 2 locking tabs with slings)
SB15m	KR WIFOVER (Kit 2 locking tabs with slings)
SB18m	KR WIFOVER (Kit 2 locking tabs with slings)

[Locking tabs](#) (p.69)

[Locking tabs](#) (p.69)

*

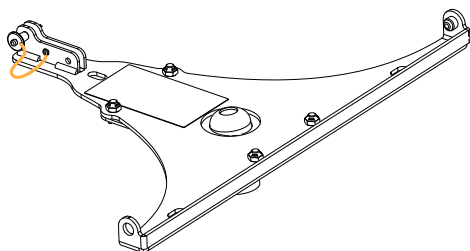
*: contact your L-Acoustics representative

Related tasks

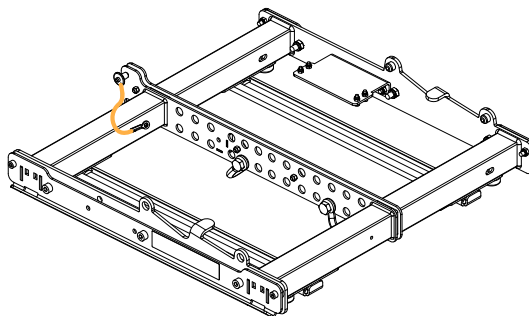
[Rigging part inspection](#) (p.18)

Ball-locking pins

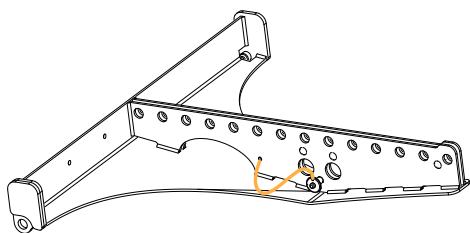
Reference pictures



tether (KIET)



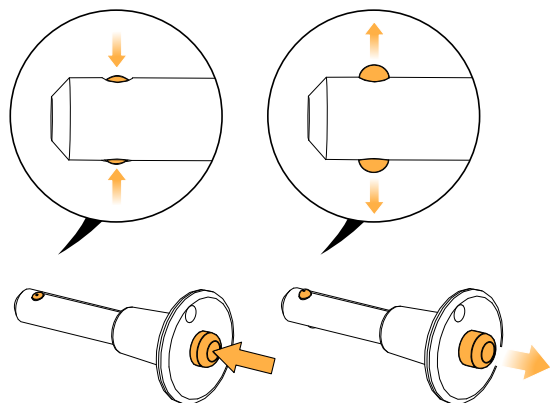
tether (KIBU-SB)



tether (KIBU)

Moving parts

1. Press the push button. The ball-locking mechanism is retracted.
2. Release the button. The ball-locking mechanism is activated.

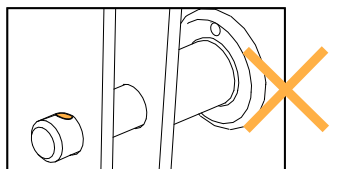
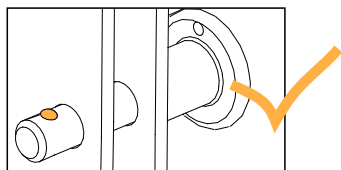


3. Insert the pin in its storage and rigging locations.

If the pin is inserted in two plates, the ball must pass between both plates and lock the pin in place.



If the check fails, **immediately withdraw the product from use and contact L-Acoustics.**



Repair kits (KR)

Ball-locking pin

KIBU-SB	KR PIN670 (KR ball-locking pin KIBU/KIBU II)	Pin (p.70)
SB18	KR PIN601 (Kit 10 pins long T-shaped head screws & rivets)	Pins (p.50)
KIET	KR PIN670 (KR ball-locking pin KIBU/KIBU II)	*
KIBU	KR PIN670 (KR ball-locking pin KIBU/KIBU II)	*

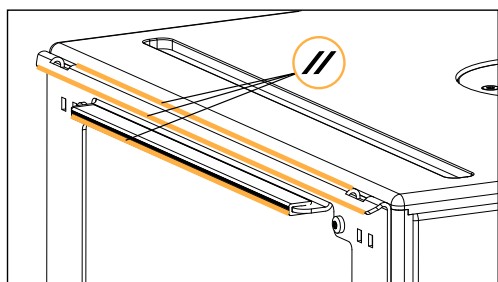
*: contact your L-Acoustics representative

Related tasks

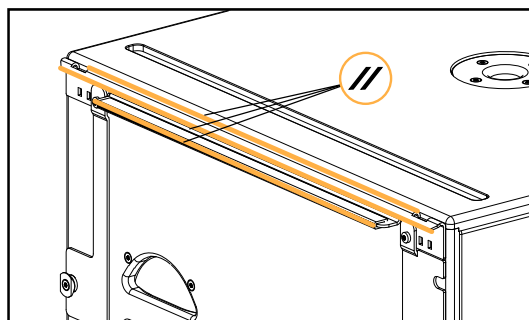
[Rigging part inspection](#) (p.18)

Rigging rails and storage pins

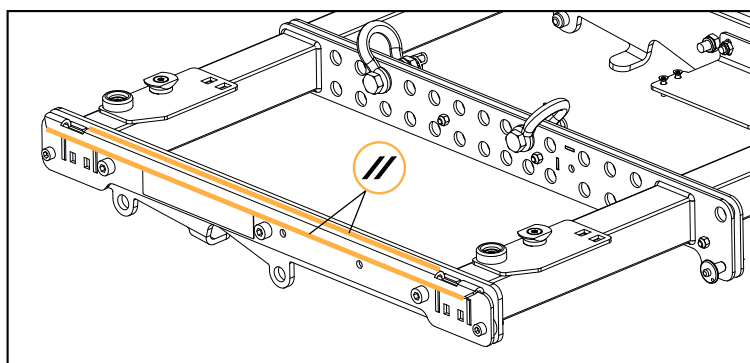
Reference pictures



SB15m geometry



SB18m geometry



KIBU-SB geometry

Repair kits



Contact your L-Acoustics representative for repair instructions.

Rail

SB15m	KR SB15MJOUE (Kit 2 side rigging assemblies SB15M)
SB18m	KR SB18MRAIL (Kit 2 rails for SB18M rigging assembly)
KIBU-SB	on demand

Storage pin

SB15m	KR WIFOPION (Kit 4 pins for coupling bars in storage mode)
SB18m	KR WIFOPION (Kit 4 pins for coupling bars in storage mode)
KIBU-SB	on demand

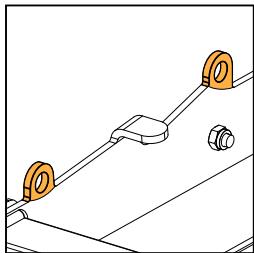
Related tasks

[Rigging part inspection](#) (p.18)

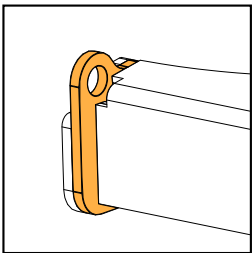
Rigging axis and lodging

Reference pictures

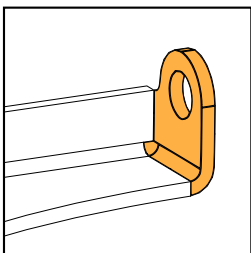
- Check that the screws are tightened.
- Check that the tabs are not bent.



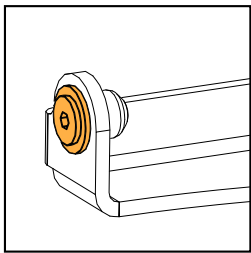
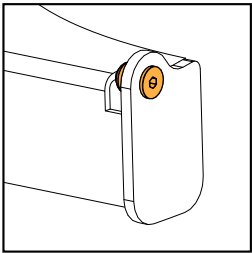
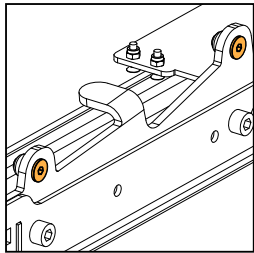
KIBU-SB



KIBU



KIET



Repair kits

! Contact your L-Acoustics representative for repair instructions.

Rigging axis

KIBU-SB	KR CVKIRIGAXE (Kit 10 rigging axe & screws)
KIET	KR CVKIRIGAXE (Kit 10 rigging axe & screws)
KIBU	KR CVKIRIGAXE (Kit 10 rigging axe & screws)

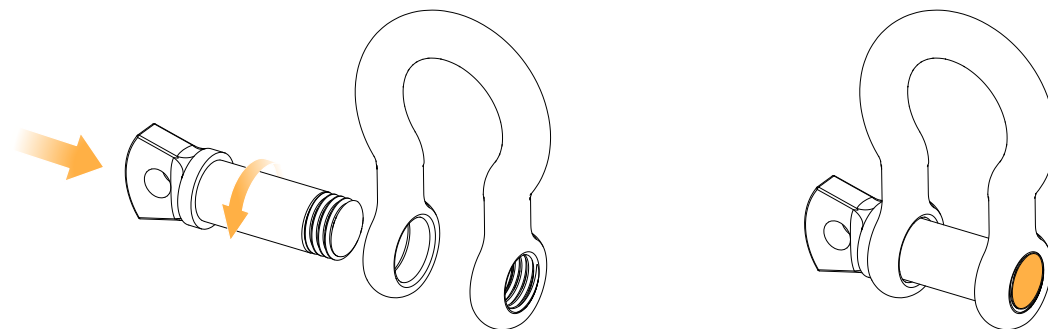
Related tasks

[Rigging part inspection](#) (p.18)

Shackles

Moving parts

Drive the shackle axis in its lodging. Make sure that the end is flush with the shackle.



Repair kits

12 mm shackles

KIBU-SB

KR CAMAN12 (Kit 4 straight shackles 12 mm)

KIBU

KR CAMAN12L (KR bow shackles 12 mm (x2))

Related tasks

[Rigging part inspection](#) (p.18)

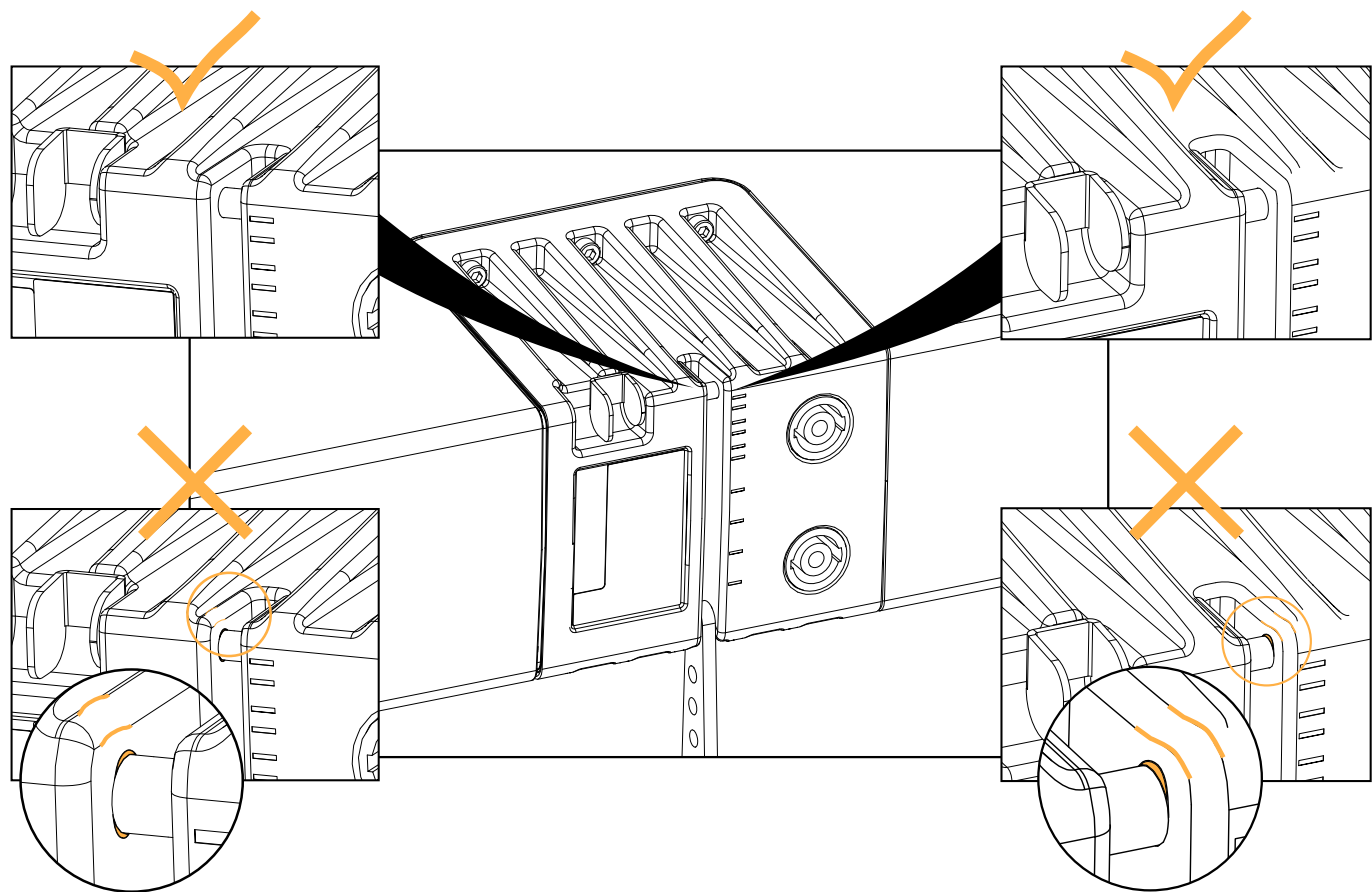
Back cover inspection

About this task

In order to assess the deformation of the back cover of Kiva, inspect the back cover on every single enclosure.
Take down the enclosure before inspection.

Procedure

- Check the rigging pin holes for signs of **ovalization**.
The hole should fit the pin with no visible gap.
- Touch the rim around the rigging pin and make sure no **bump** is perceptible.



What to do next

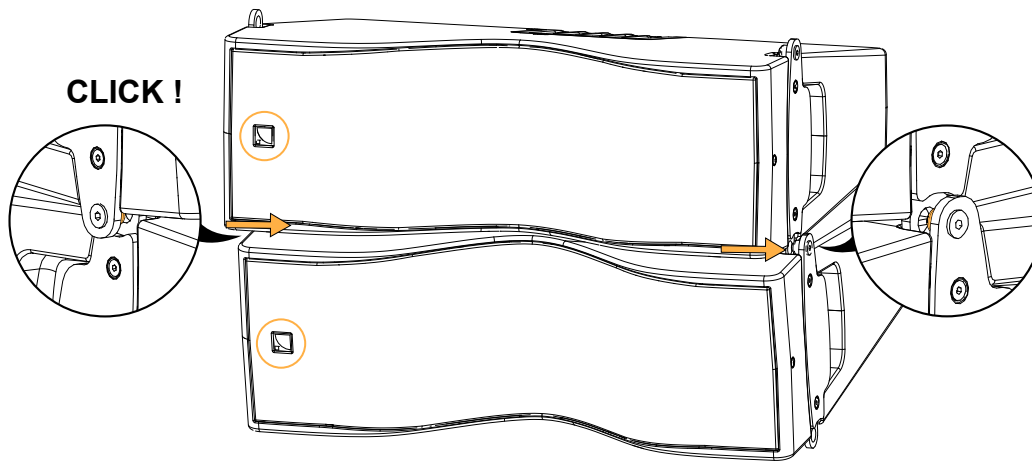
If any deformation is detected, immediately withdraw the product from use for corrective maintenance:

enclosure	repair kit(s)	procedure
Kiva	<ul style="list-style-type: none">• 1 × KR KIVARIGAR (Kit KIVA back rigging assembly)	Kiva back cover (p.38)

Rigging check

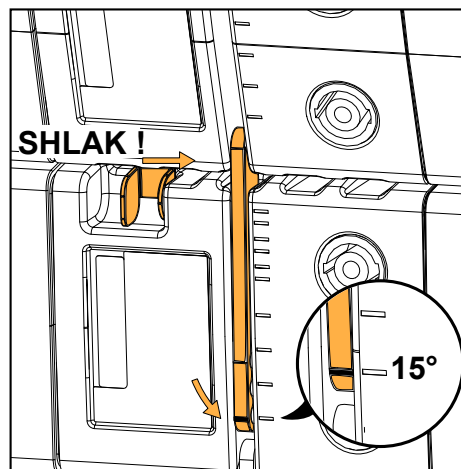
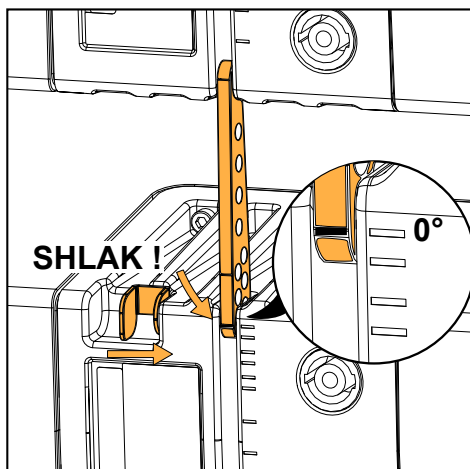
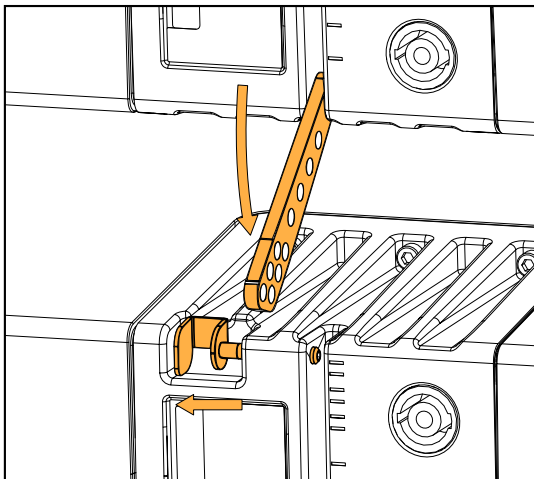
Procedure

1. Secure one Kiva on top of a second one (logos on the left).



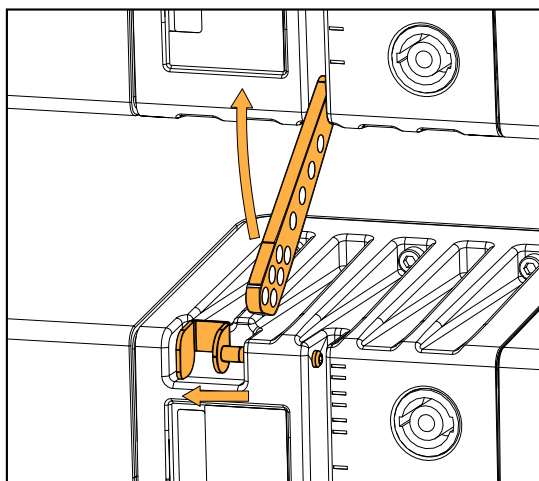
- The safety clicks back into place.
- Both rigging axis fit in their lodgings.

2. Secure the rear rigging arm at the 0° and at the 15° position.



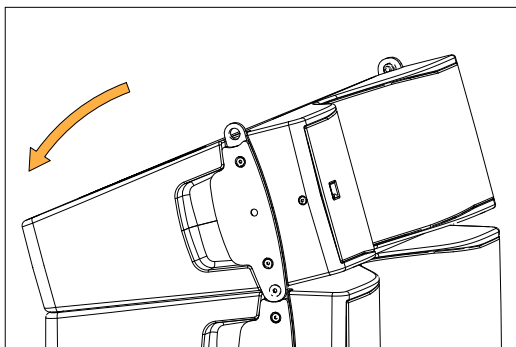
3. Hold the top enclosure by the handles and shake the assembly.
The two enclosures remain attached.

4. Release the rigging arm of the top enclosure.

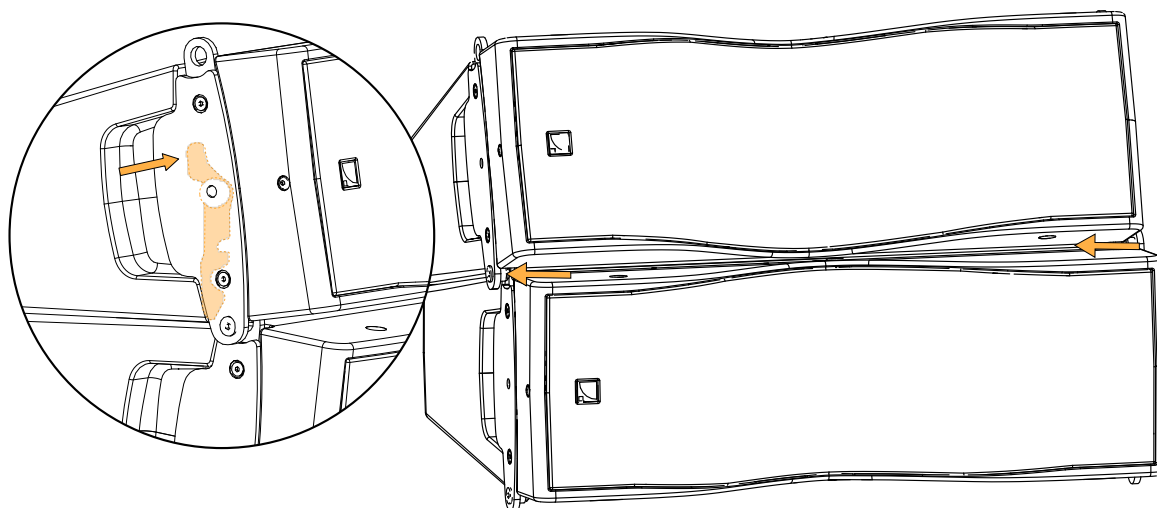


Risk of trapping hand/fingers

Carefully release the back of the enclosure until it rests on the assembly.



5. Unlock the mechanism inside the left handle of the top enclosure and slide the enclosure to the left.



6. Switch the enclosures and repeat the procedure.

Acoustical check

Enclosure check



This feature is available on:

LA4X

LA12X

ENCLOSURE CHECK measures impedance at the reference frequencies for the connected loudspeaker family. The measured impedance is compared to the expected range allowing for fast detection of loudspeakers presenting circuit continuity issues.



The results can be used for preliminary diagnosis but cannot replace a comprehensive quality control.

Prerequisite



ENCLOSURE CHECK measurements can only be reliable if the following requirements are met:

Environment and temperature:

- Ambient temperature must be comprised between 0 °C / 32 °F and 40 °C / 104 °F. Ideal temperature is 20 °C / 68 °F.
- Enclosures must be at room temperature. If warm from a recent high level use or recently moved from a cold environment, let the loudspeakers reach room temperature before starting.

Enclosures:

- Enclosures must be included in the embedded factory preset library.
- Enclosures must be in nominal operating conditions:
 - Remove covers or dollies obstructing the loudspeakers or the vents.
 - Check for obvious physical damage or air leak: visually inspect the grill, gasket, cabinet, and connector plate for loose, missing or damaged parts.

Connection:

- Use only 10 m / 30 ft 4 mm² / AWG 11 speaker cables.
- Do not connect enclosures in parallel.

Amplified controllers:

- LA4X must run at least firmware version 1.1.0.
- LA4X load sensors must be calibrated. Refer to the **Load Sensor Calibration Tool** technical bulletin for more information.
- LA4X must warm up for at least 10 minutes after power up. Do not power off, reboot or switch to standby mode to avoid resetting the countdown.
- Load a preset corresponding to the connected loudspeaker's family. Presets from the user memories may be used on condition they are made of presets supported in the embedded factory preset library.

Procedure

1. Power up the amplified controller. Let LA4X warm up for at least 10 minutes.
2. Connect the loudspeaker enclosures to the amplified controller.
3. Load a preset from or built from the embedded library corresponding to the connected loudspeaker family.
4. On the amplified controller, use the encoder wheel to select **MONITORING & INFO**. Press the OK key or the encoder wheel to validate.
5. Use the encoder wheel to select **ENCLOSURE CHECK**.



Beware of sound levels.

Although the sound pressure levels generated for the ENCLOSURE CHECK are moderate, do not stay within close proximity of the loudspeakers and consider wearing ear protection.

6. Press the OK key or the encoder wheel to launch the ENCLOSURE CHECK.

The amplified controller generates short sinusoidal signals simultaneously for each connected output.

The amplified controller displays the results for each output.

7. Depending on the displayed results, follow the instructions in the table.

result	interpretation	instructions
OK	measured impedance is within expected range	enclosure is in working order electrically
?	unsupported preset family	only supported enclosures should be tested
NC	Not Connected	if cables are connected: a. inspect the cables and connections b. go to step 8 (p.29)
NOK	measured impedance is not within expected range	a. check that all the prerequisites are met, in particular that the loaded preset corresponds to the connected speaker's family b. inspect the cables and connections c. go to step 8 (p.29)
UNDEF	measured impedance is undefined	

8. Under NC, NOK and UNDEF results, press and hold the corresponding OUT key.

The amplified controller displays:

- the tested frequencies,
- information on the measured impedance:
 - OPEN for open circuit (found in NC results),
 - SHORT for short circuit (found in NOK results), or
 - a percentage of variation from the expected range (found in NOK and UNDEF results)
- the number of operational transducers out of the total



Low variations from the expected range are acceptable: displayed percentage can be different from 0 and all transducers considered operational.

Listening test

enclosure	preset	usable bandwidth
Kiva	[KIVA]	80 Hz - 20 kHz
SB15m	[SB15_100]	40 Hz - 120 Hz
SB18 / SB18i / SB18m	[SB18_100]	32 Hz - 110 Hz

Procedure

1. Load the preset on an LA4X / LA8 / LA12X amplified controller.
2. Connect a sinus generator to the amplified controller.



Risk of hearing damage

Set a low sound level to start and use ear protection to adjust before testing.

3. Scan the bandwidth focusing on the usable range.
The sound should remain pure and free of unwanted noise.

Troubleshooting for LF speakers

One or more LF loudspeaker produces distorted, buzzing, rubbing, clicking, muffled or weak sound.

Possible causes

- The screws are not tightened with the appropriate torque.
- There is an air leak in the gasket.
- There is dust on the cone.
- The cone is damaged.
- The surround is torn or delaminated.
- The voice coil or the spider is damaged.

Procedure

1. Perform the loudspeaker disassembly procedure.
2. Visually inspect the loudspeaker and the cables.
If any damage is visible, replace the loudspeaker.
3. Carefully clean the loudspeaker with a dry cloth.
4. Perform the reassembly procedure.
Replace the loudspeaker gasket and the screws.
Apply the recommended torque.
5. Repeat the listening test.
If the problem persists, replace the loudspeaker.

Troubleshooting for HF speakers

One or more HF loudspeaker produces high-frequency harmonic distortions, strange vibrations or weak sound.

Possible causes

- There are foreign particles on the air gap.
- The screws used for reassembly are too loose.
- The diaphragm is damaged.

Procedure

1. Perform the diaphragm disassembly procedure.
2. Visually inspect the diaphragm and the voice coil.
If any damage is visible, replace the diaphragm.
3. Clean the air gap thoroughly.

- 4.** Perform the reassembly procedure.
Pay close attention to the position of the diaphragm.
Apply the recommended torque.
- 5.** Repeat the listening test.

Loudspeaker connection

Connection to LA4X

Maximum number of enclosures per LA4X

enclosure	max enclosures in parallel	max enclosures per controller
Kiva	2	8
SB15m	1	4
SB18	1	4

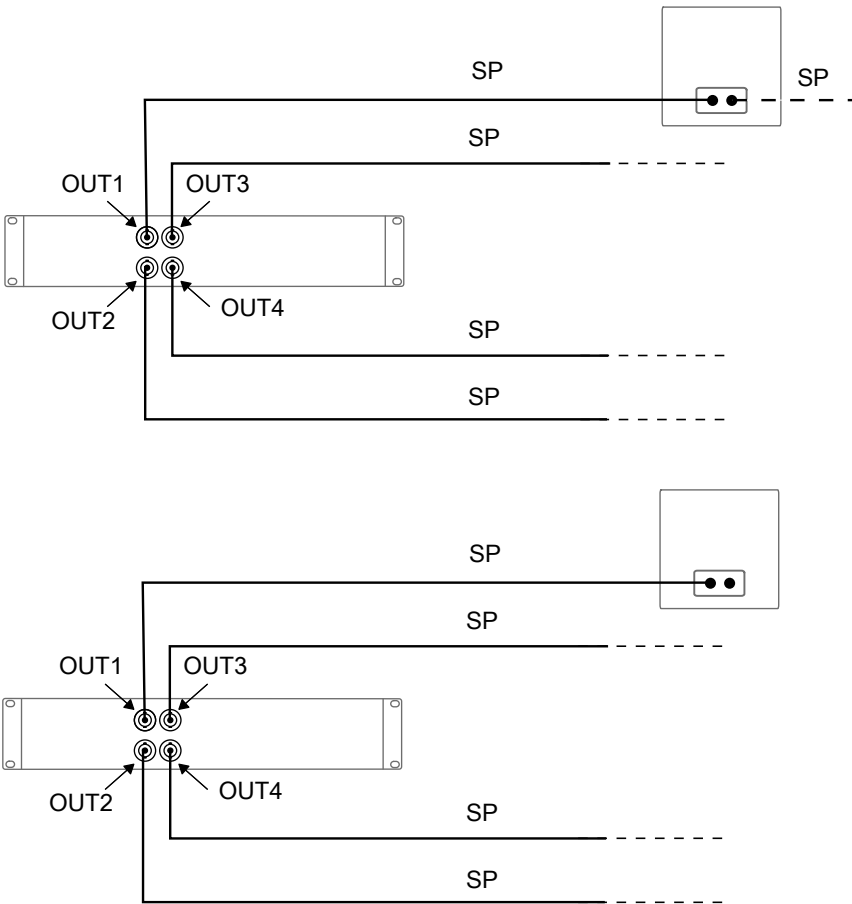
Impedance load

Kiva SB15m SB18

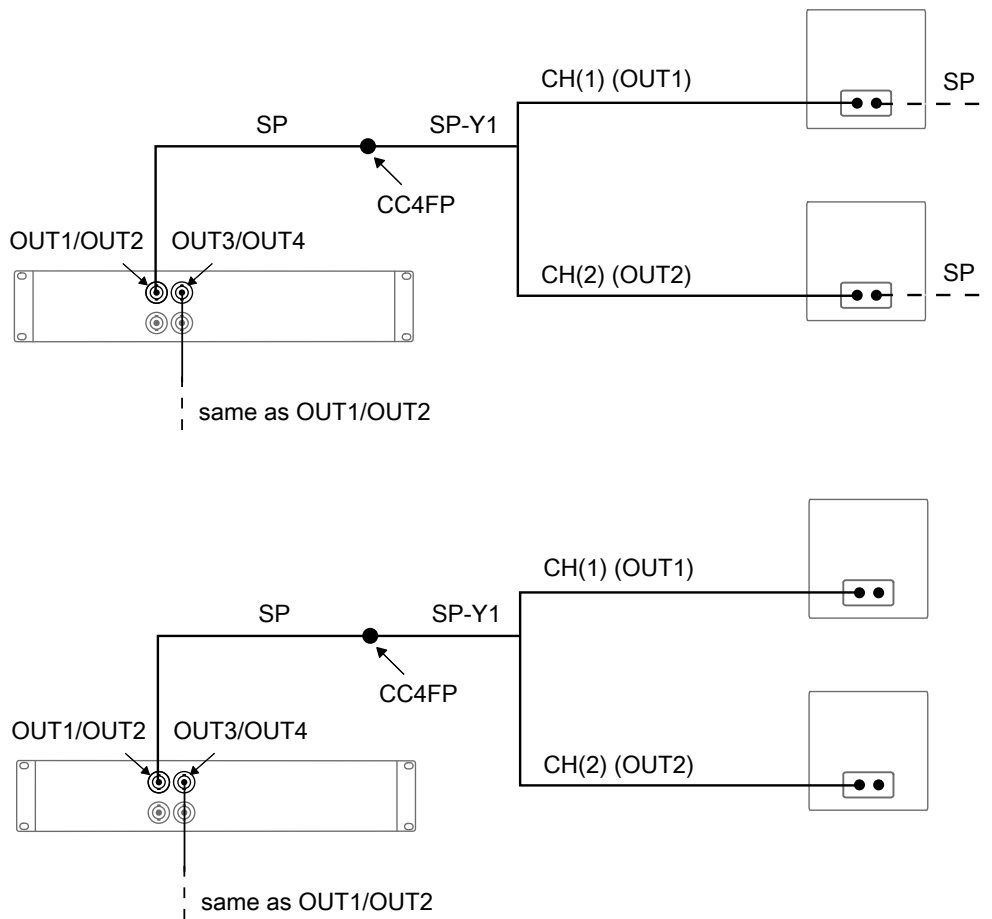
- 1 enclosure: 8 Ω
- 2 enclosures in parallel: 4 Ω

Connecting 2-way passive enclosures or subwoofers

SP on speakON output



SP and SP-Y1 on speakON output



Connection to LA8

Maximum number of enclosures per LA8

enclosure	max enclosures in parallel	max enclosures per controller
Kiva	3	12
SB15m	2	6
SB18	2	8



LA8 can drive up to two SB15m per output, but no more than six per controller at high level.

Impedance load

Kiva SB15m SB18

1 enclosure: 8 Ω

2 enclosures in parallel: 4 Ω

3 enclosures in parallel: 2.7 Ω

Connection to LA12X

Maximum number of enclosures per LA12X

enclosure	max enclosures in parallel	max enclosures per controller
Kiva	3	12
SB15m	3	12
SB18	3	12

Impedance load

Kiva SB15m SB18

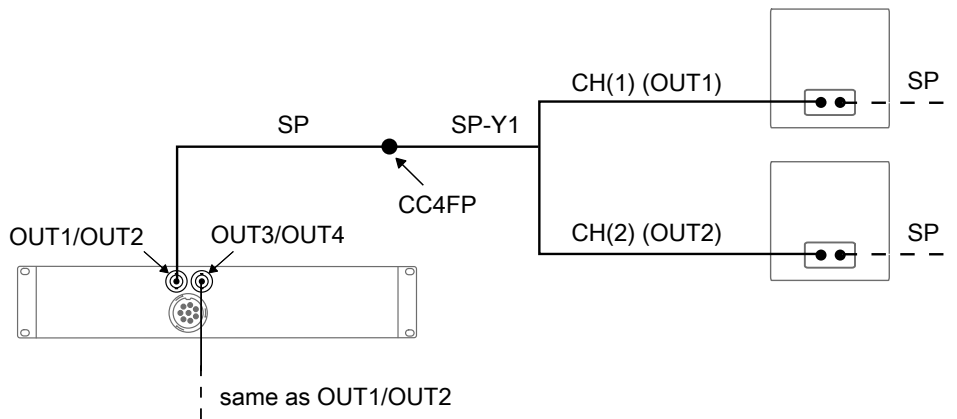
1 enclosure: 8 Ω

2 enclosures in parallel: 4 Ω

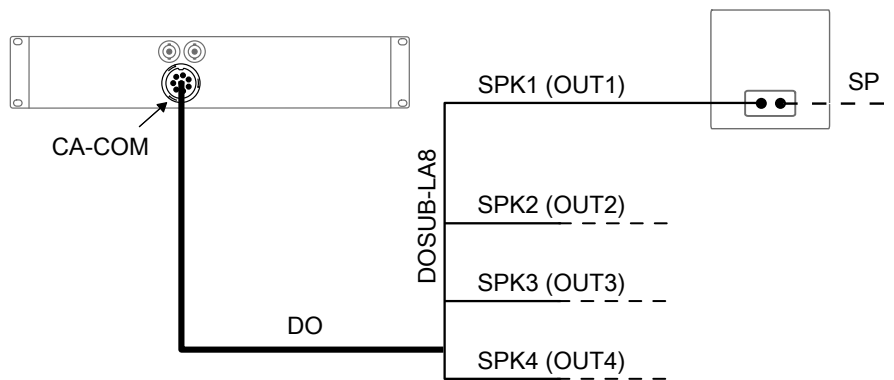
3 enclosures in parallel: 2.7 Ω

Connecting 2-way passive enclosures or subwoofers

SP and SP-Y1 on speakON output



DO and DOSUB-LA8 on CA-COM output



Corrective maintenance

Tools

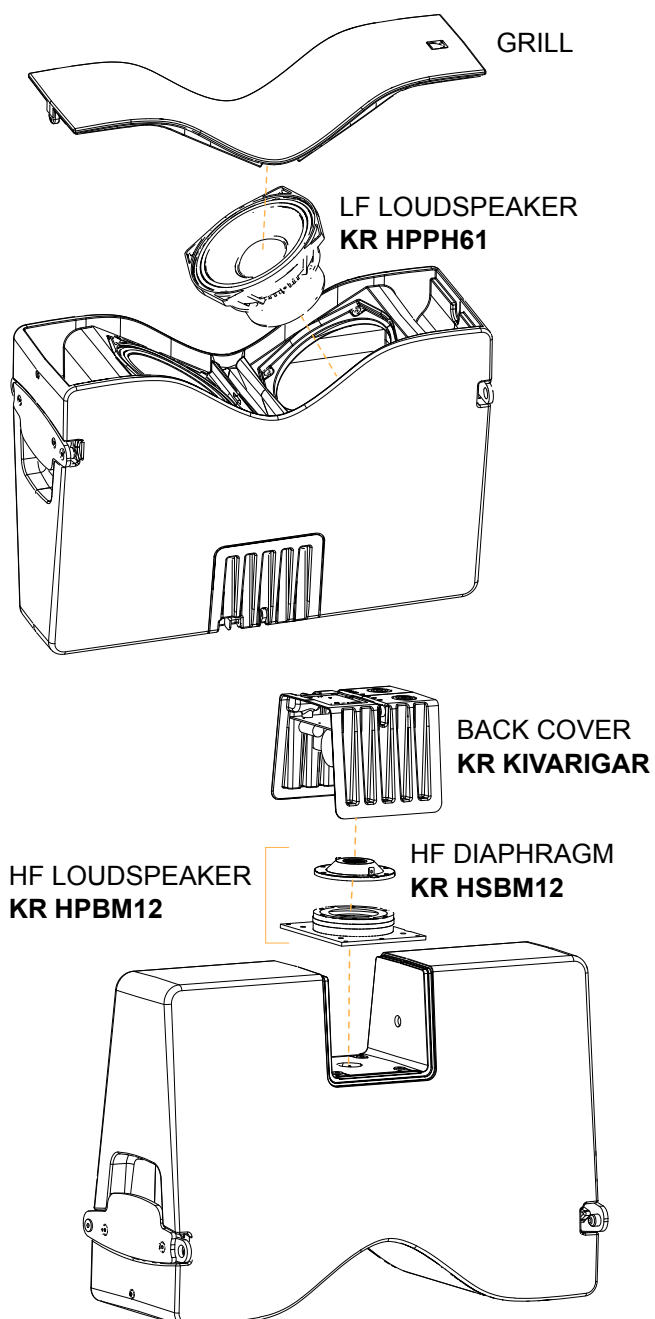
Before performing corrective maintenance, make sure all the tools listed are available.
Reference are given for FACOM® products in this table. Other manufacturers can be used.

name	reference	distributor
Set of 6-point 1/4" sockets	R.360NANO	FACOM
Torque screwdriver (2 - 10 N.m)	A.404	FACOM
riveting pliers	Y.103B	FACOM

Kiva

Exploded view

In the exploded view, each assembly corresponds to a D/R procedure and the necessary repair kit(s).



D/R - Kiva back cover

Tools

- torque screwdriver
- screwdriver extension
- 4 mm hex bit
- T25 Torx bit

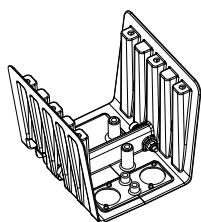
Consumables

- blue threadlocker

Repair kit

KR KIVARIGAR

Kit KIVA back rigging assembly



x1

SE RIGKIVAR
back cover



x6

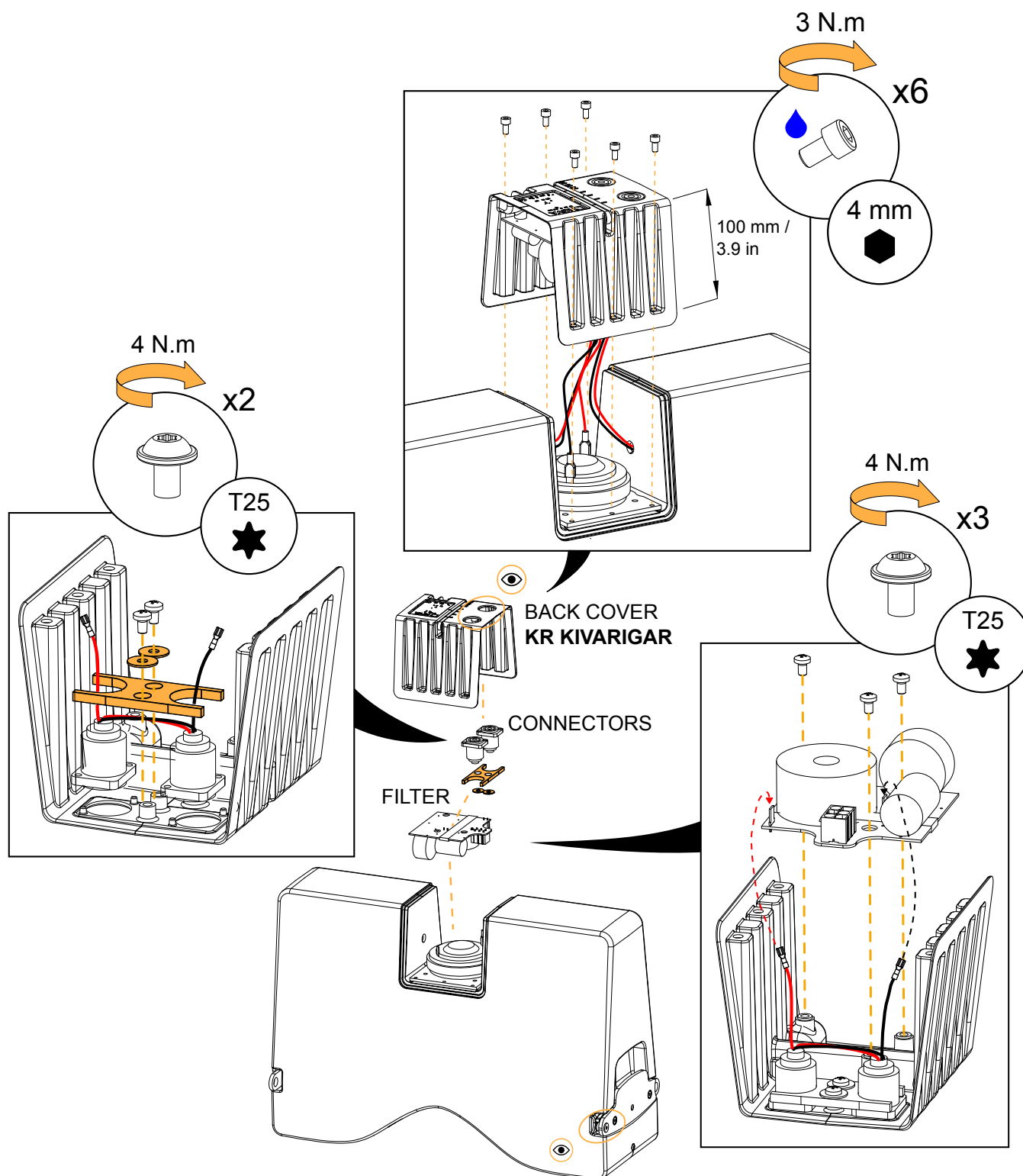
S192
M5x8 hex



x5

S204
M5x8 Torx

Exploded view



Procedure

1. Remove the back cover.
Disconnect the cables.
2. Remove the filter and the speakON connectors from the back cover.
Save the linking plate and the washers.
3. Secure the speakON connectors and the filter on the new back cover.
Plug the speakON connectors cables on the filter.
4. Connect the loudspeaker cables to the filter and secure the new back cover.
Position the speakON connectors on the same side as the safety mechanism.

D/R - HF loudspeaker

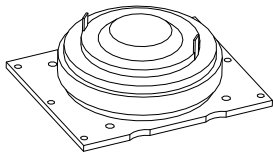
Tools

- torque screwdriver
- 4 mm hex bit

Repair kits

KR HPBM12 ¹

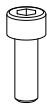
Kit HP BM12 Driver 1.5" - 8 ohms



x1

G251

1" HF compression driver assembly



x4

S187

M5x15 hex



x4

S153

spring washer Ø5 mm



x4

S158

plain washer Ø5 mm

¹ The screws are also available in KR HSBM12 - Kit diaphragm for 1.5" driver .

Prerequisite

Back cover disassembled.

See [Kiva back cover](#) (p.38).

Exploded view

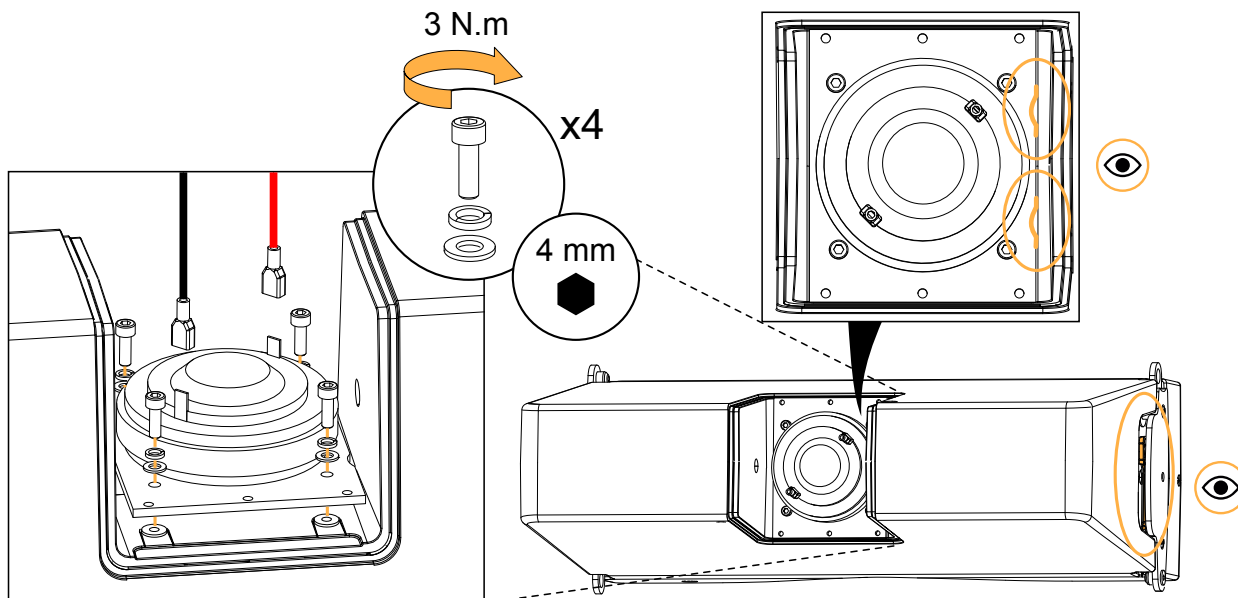


For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.

Position the notches on the driver plate on the same side as the safety mechanism.



Gradually tighten the screws following a star pattern.



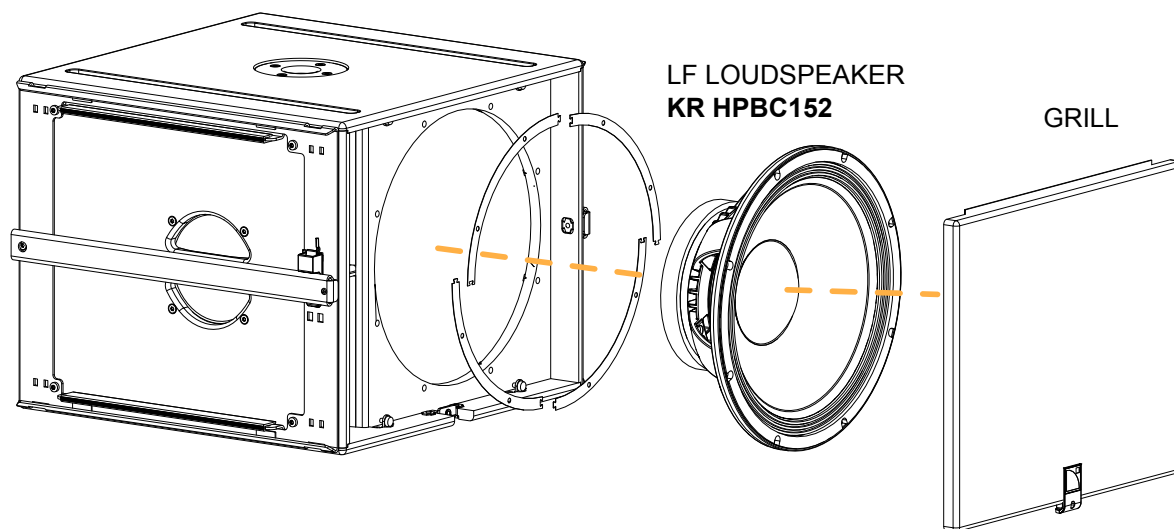
What to do next

Perform the [Acoustical check](#) (p.28) procedures.

SB15m

Exploded view

In order to operate, follow the order outlined here.



D/R - Grill

Tools

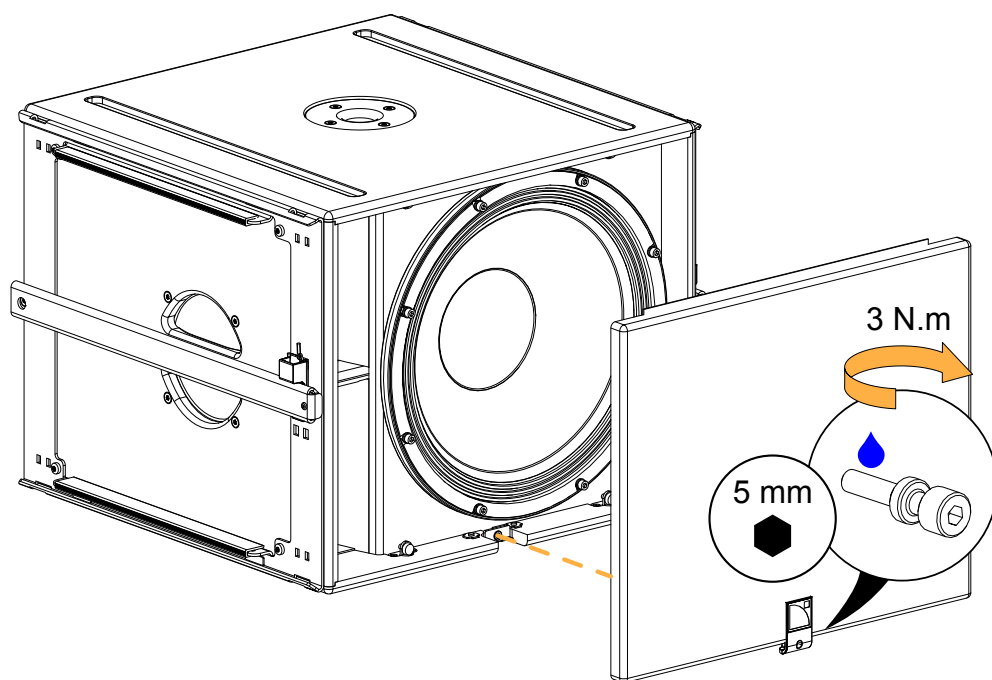
- torque screwdriver
- 5 mm hex bit

Consumables

- blue threadlocker

Exploded view

Use blue threadlocker on the captive screw.



D/R - LF loudspeaker

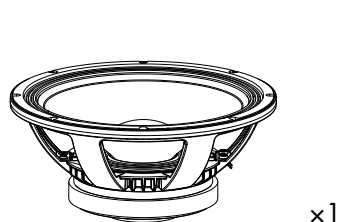
Tools

- torque screwdriver
- 5 mm hex bit

Repair kit

KR HPBC152*

Kit HP BC152 Speaker 15"



x1

FT789

15" LF/MF speaker - 8 ohms



x8

S100054

M6x30 hex



x1

-

speaker gasket kit



* The screws and fasteners are also provided in the .

Prerequisite

Grill disassembled.

See [Grill](#) (p.42).

Exploded view



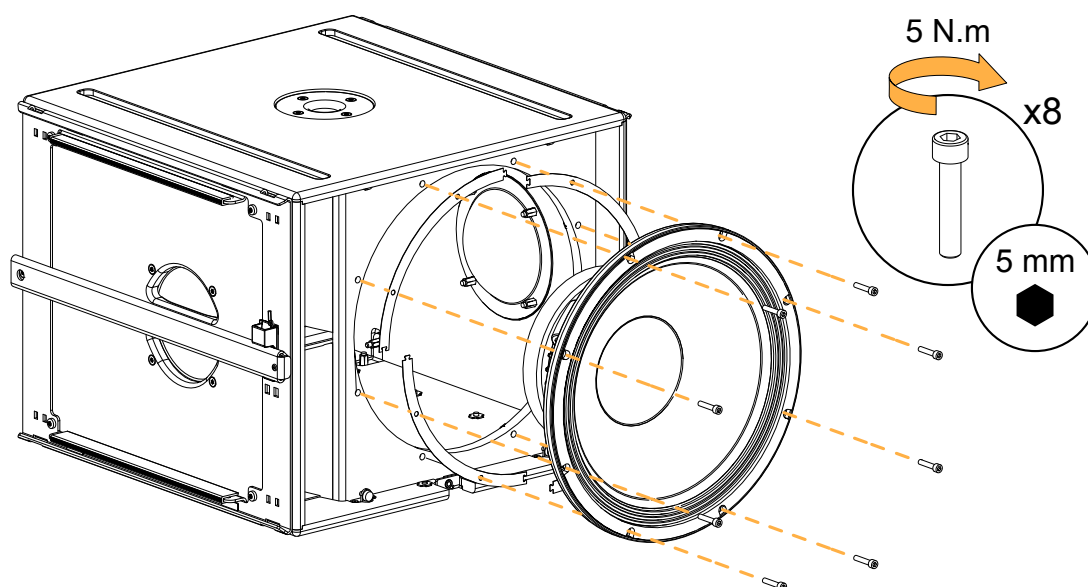
For safety reasons, always use the new screws and spare parts provided in the KR.



Gradually tighten the screws following a star pattern.



If the gasket is damaged, remove and replace it using the speaker gasket kit.



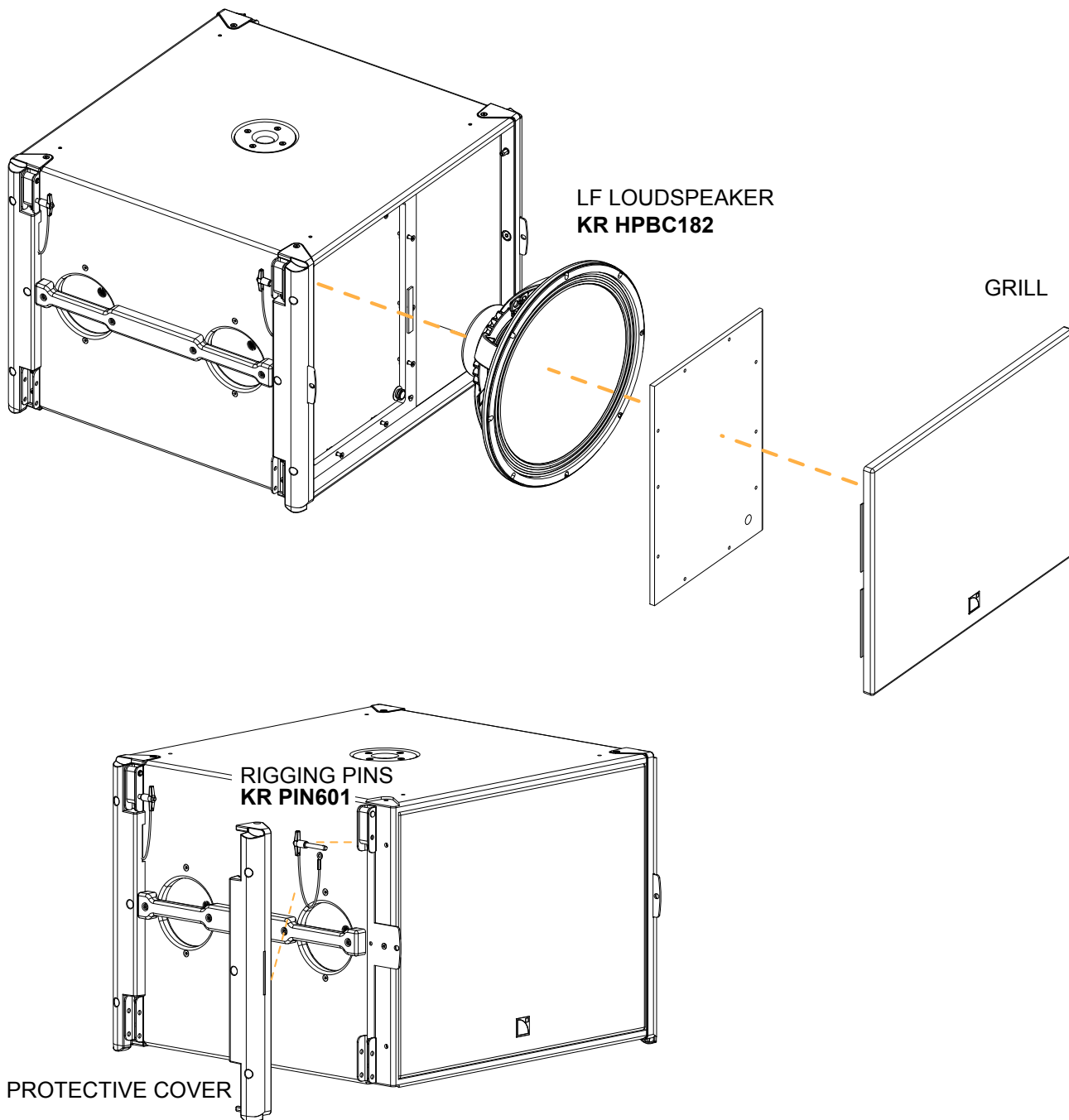
What to do next

Perform the [Acoustical check](#) (p.28) procedures.

SB18

Exploded view

In order to operate, follow the order outlined here.



D/R - GRILL

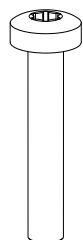
Tools

- torque screwdriver
- T30 Torx bit

Replair kit

KR HPBC182

Kit HP BC182 Speaker 18" - 8 ohms



x4

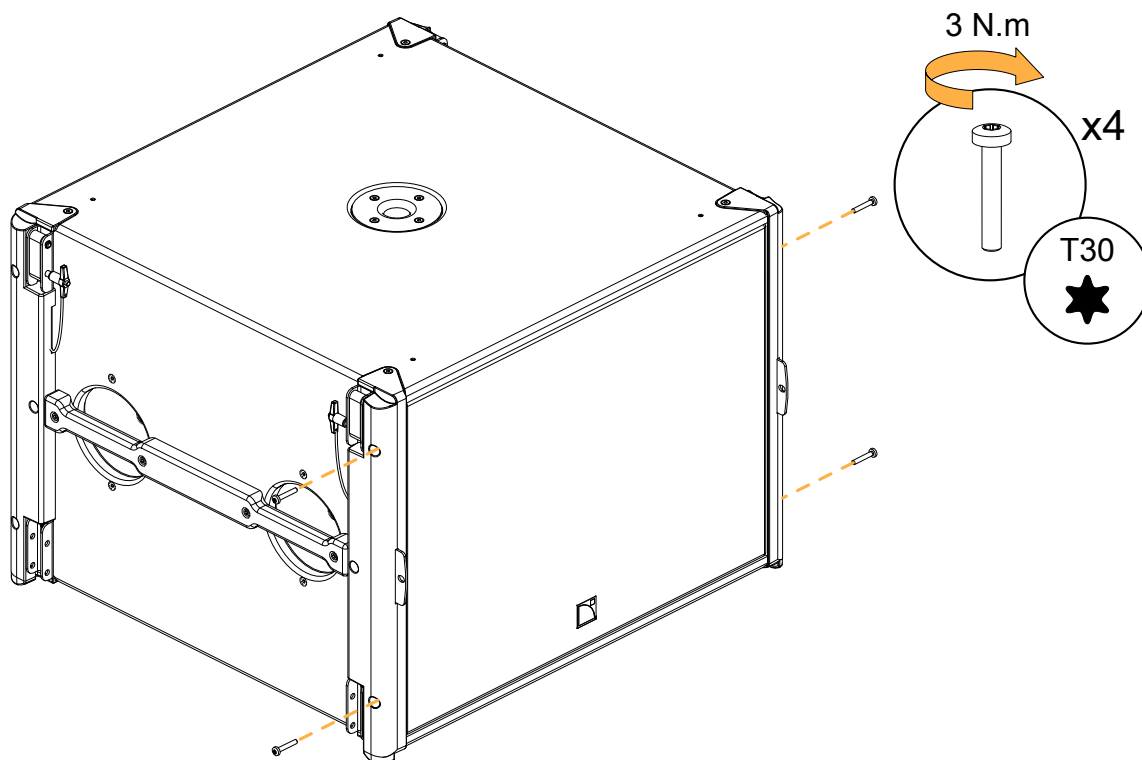
S247

M6x35 Torx

Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.



D/R - LF loudspeaker

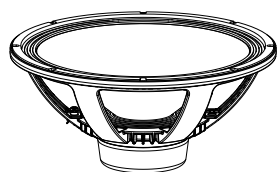
Tools

- torque screwdriver
- T30 Torx bit
- 5 mm hex bit
- blue threadlocker

Repair kit

KR HPBC182

Kit HP BC182 Speaker 18" - 8 ohms



x1

627

18" speaker - 8 ohms



x8

S100054

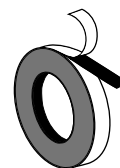
M6x30 hex



x14

S221

M6x35 Torx



x2

-

speaker gasket kit

Prerequisite

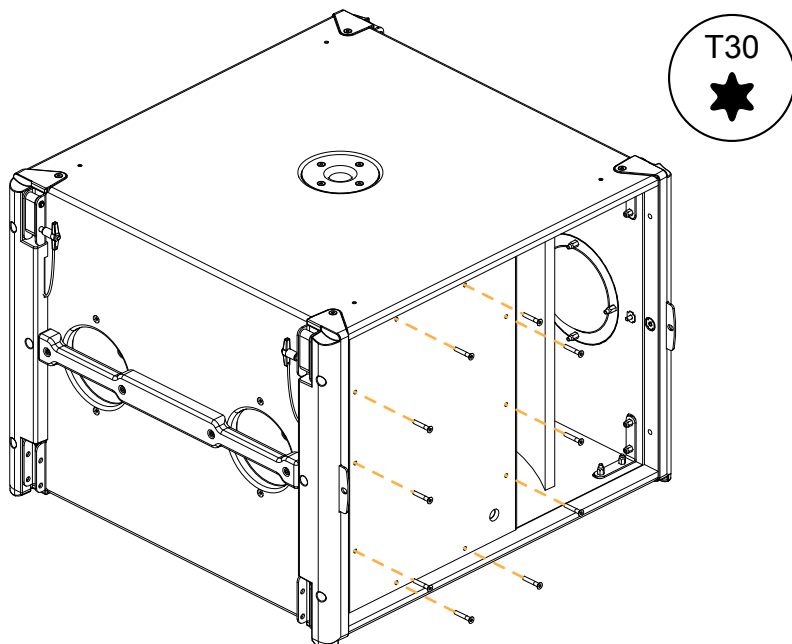
Grill disassembled.

See [GRILL](#) (p.45).

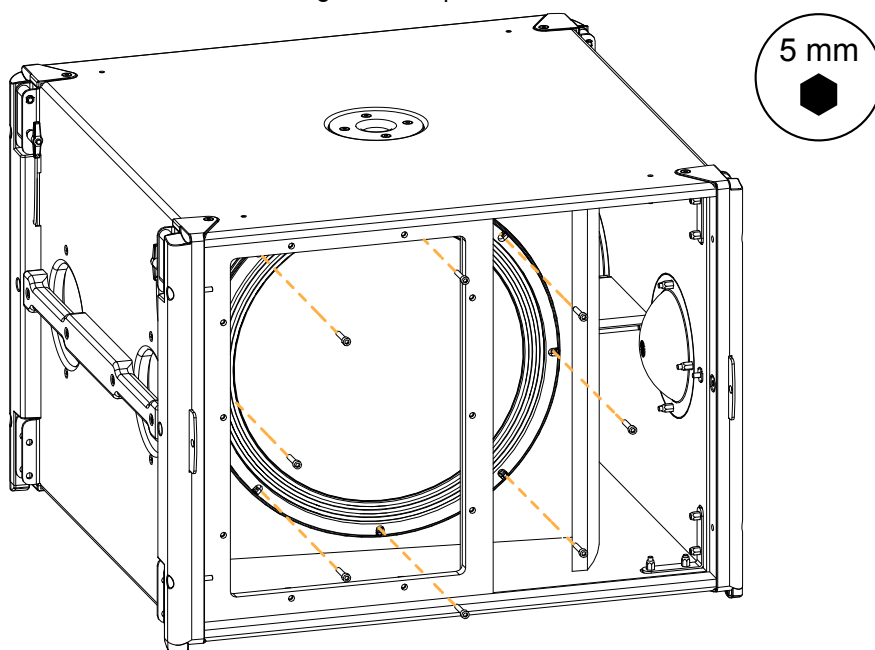
Disassembly

Procedure

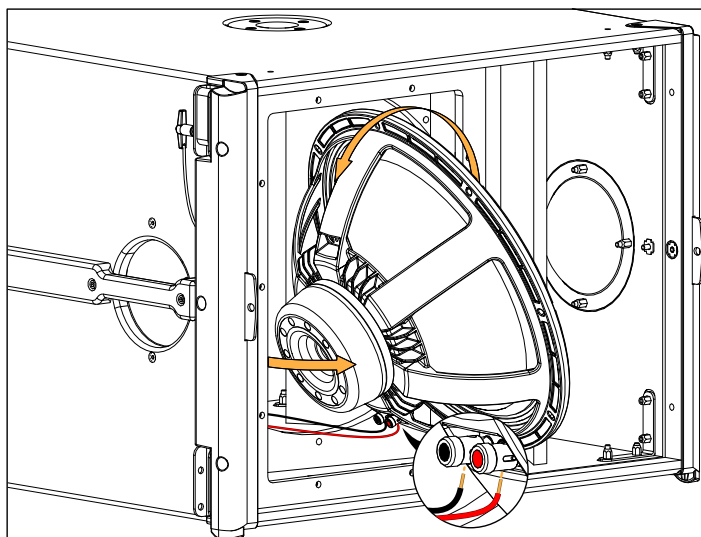
1. Remove the plate.



- 2.** Remove the screws securing the loudspeaker.



- 3.** Remove the loudspeaker from the enclosure and disconnect the loudspeaker cables.



Reassembly

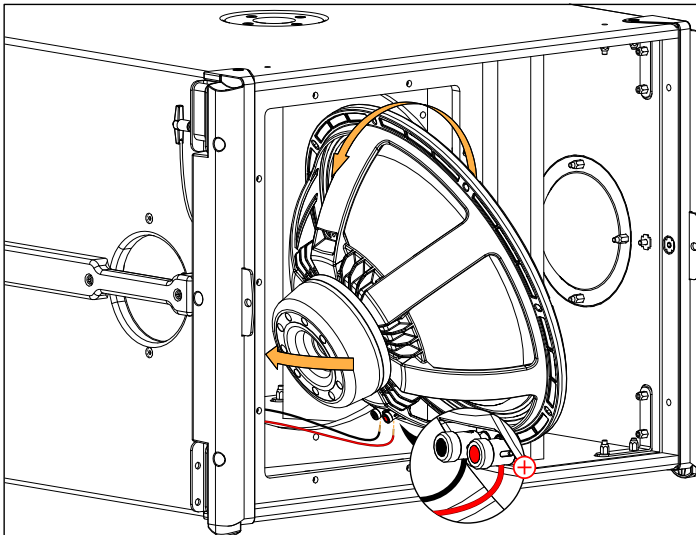
About this task



For safety reasons, always use the new screws and spare parts provided in the KR.

Procedure

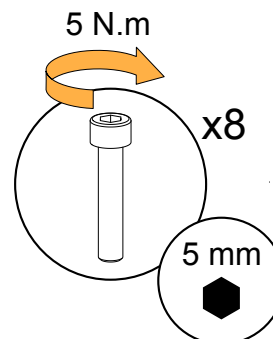
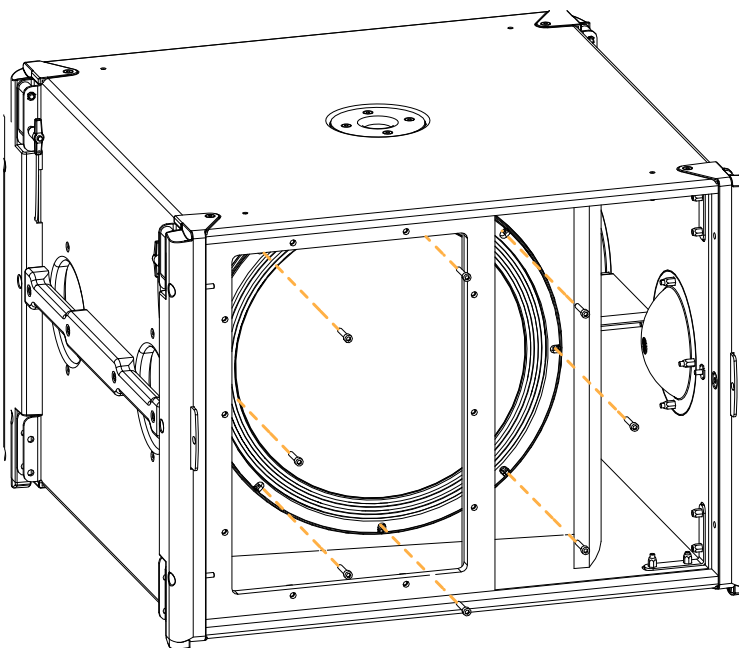
1. Stick the gasket on the cabinet.
2. Connect the loudspeaker cables and position the loudspeaker in the enclosure.



3. Secure the loudspeaker.

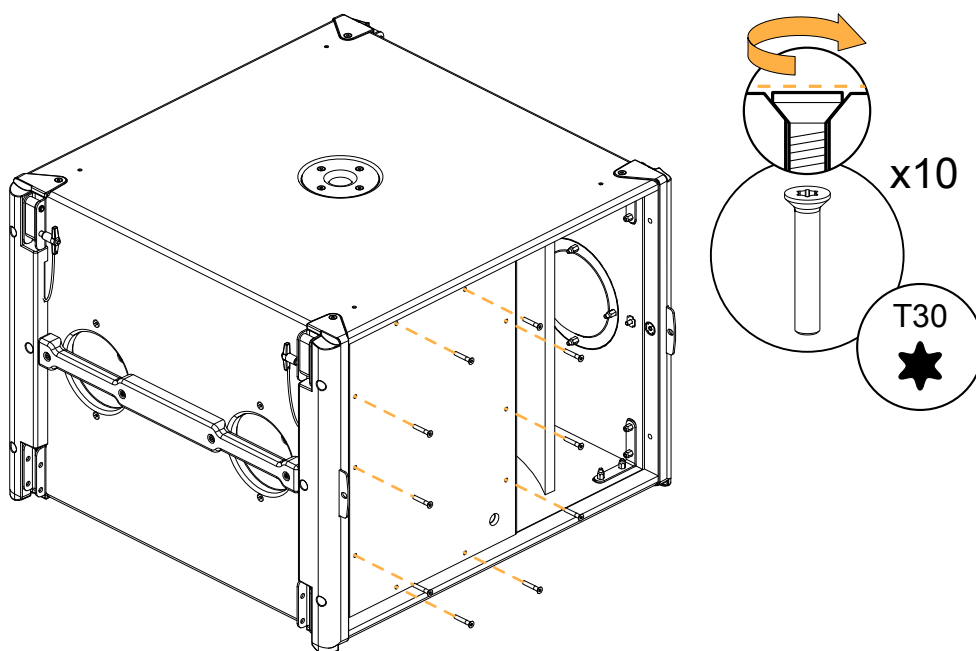


Gradually tighten the screws following a star pattern.



4. Secure the plate.

Gradually tighten the screws following a star pattern.



D/R - Pins

Tools

- torque screwdriver
- T30 Torx bit
- blue threadlocker

Repair kit



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.

KR PIN601

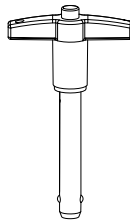
Kit 10 pins long T-shaped head screws & rivets



x20

S142

M4x10 rivet



x10

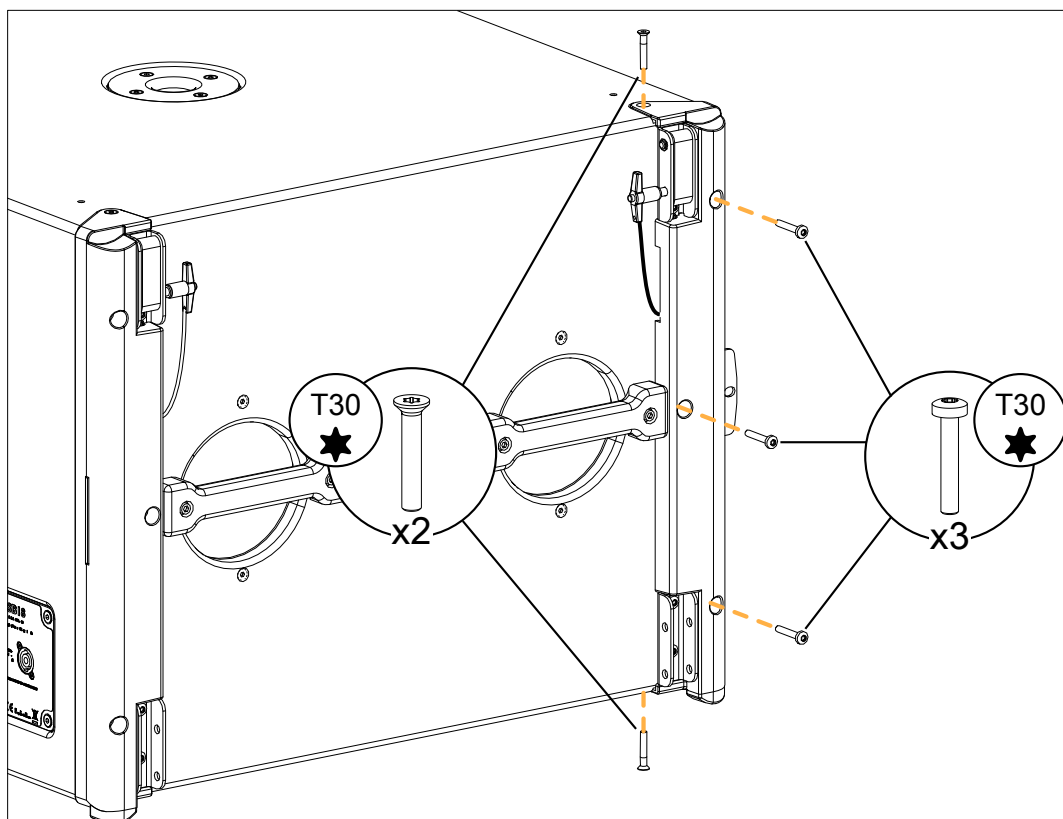
601

ball-locking pin Ø5/16" with lanyard

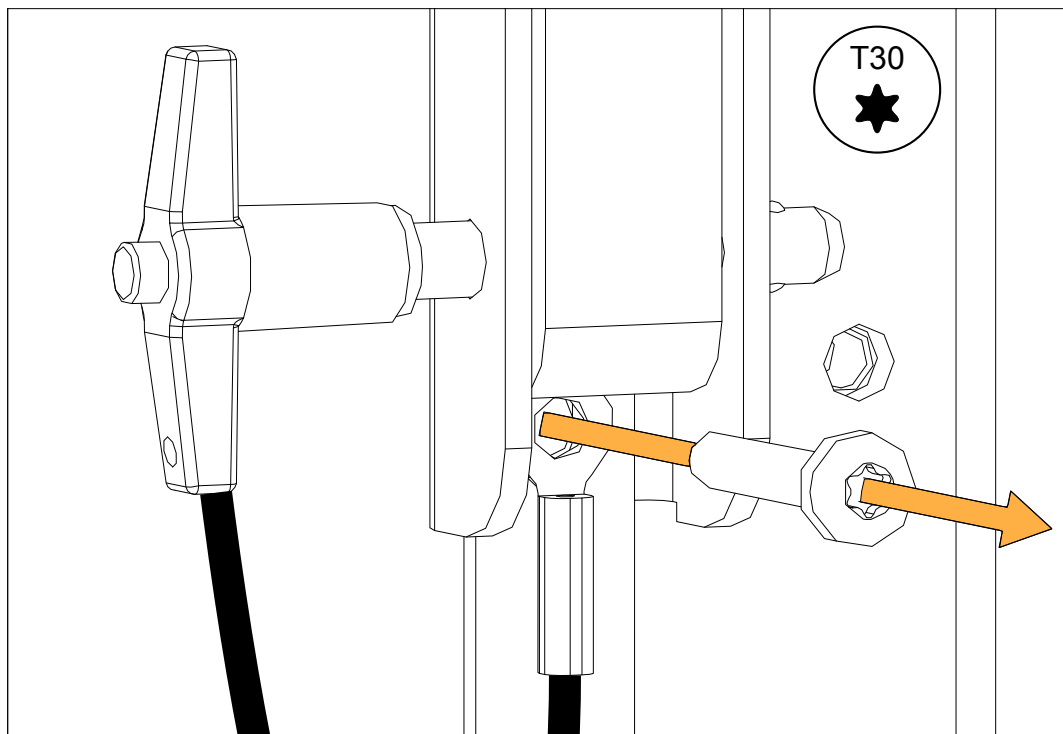
Disassembly

Procedure

1. Remove the five screws securing the protective cover to the cabinet.



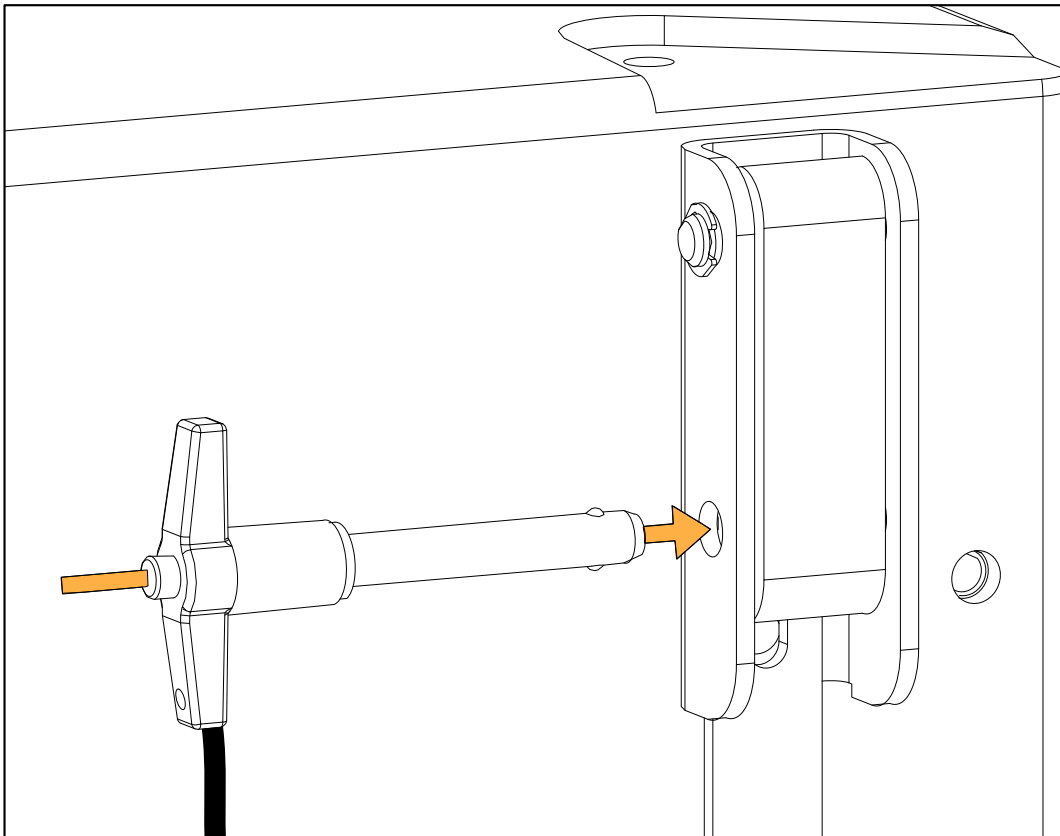
2. Remove the screw securing the steel tab.



Reassembly

Procedure

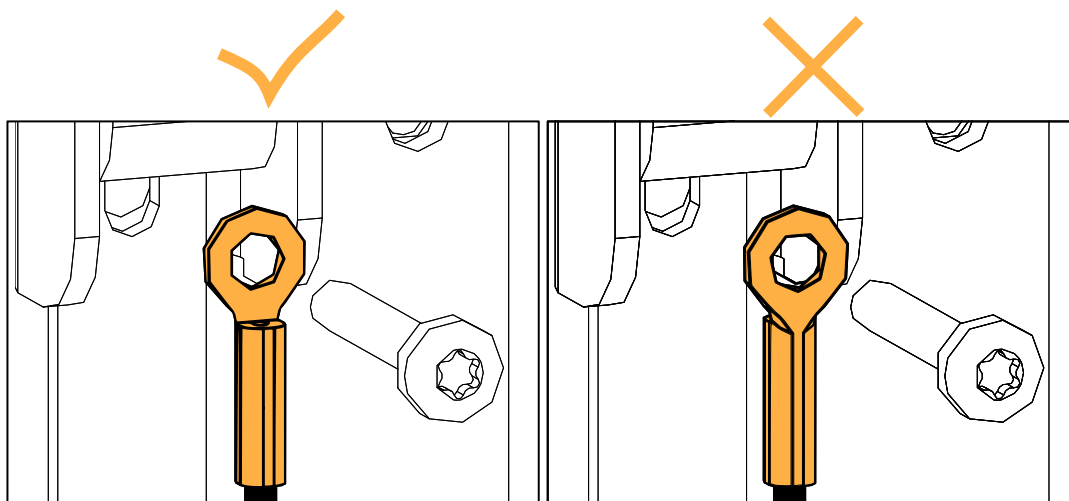
1. Insert the pin in the storage hole.



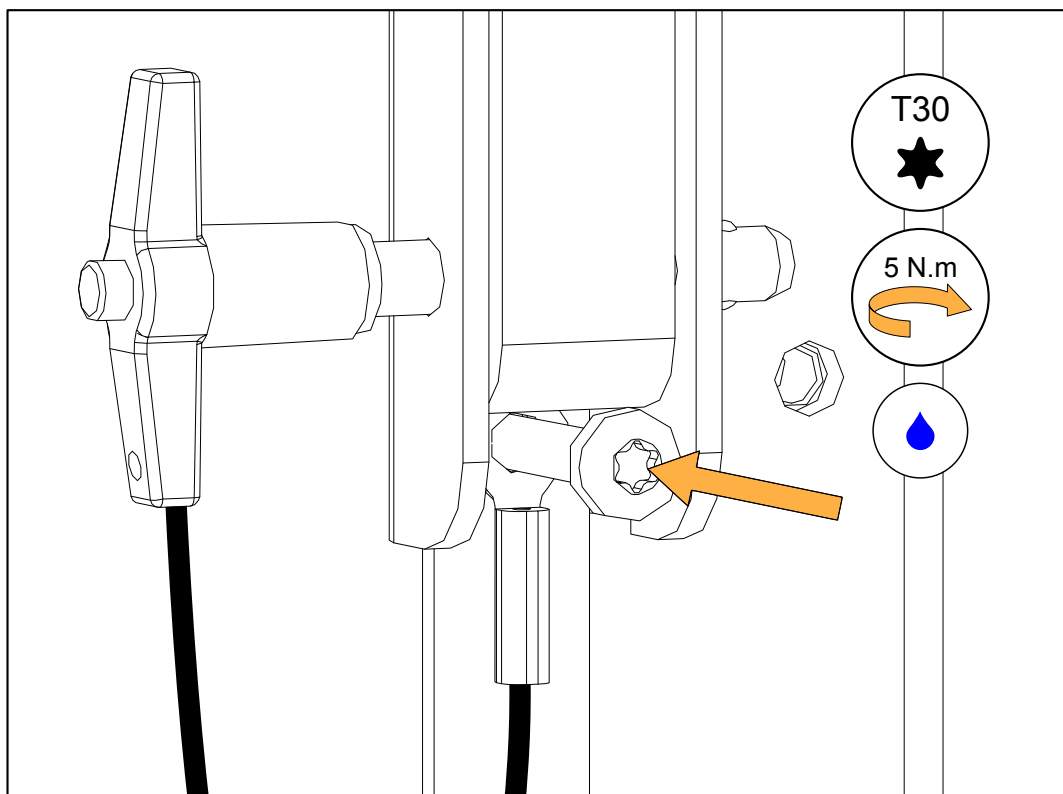
2. Position the steel tab on the screw.



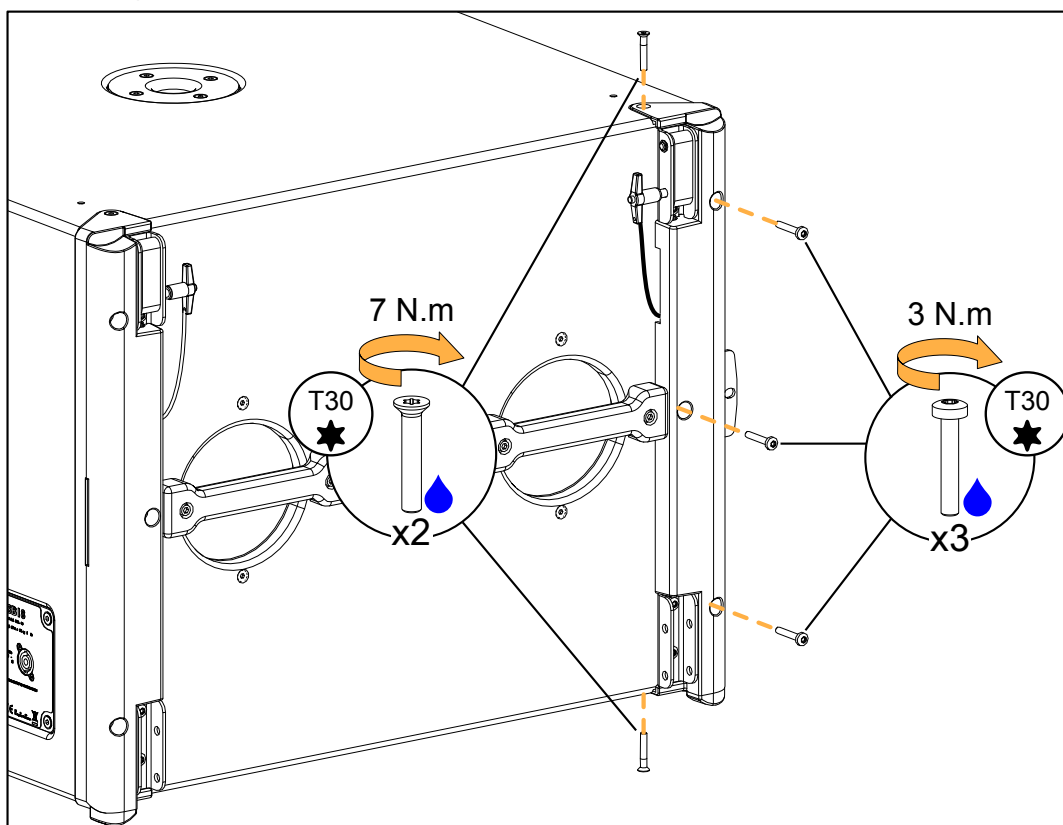
Position the flat side of the steel tab toward the cabinet.



3. Secure the steel tab to the cabinet.



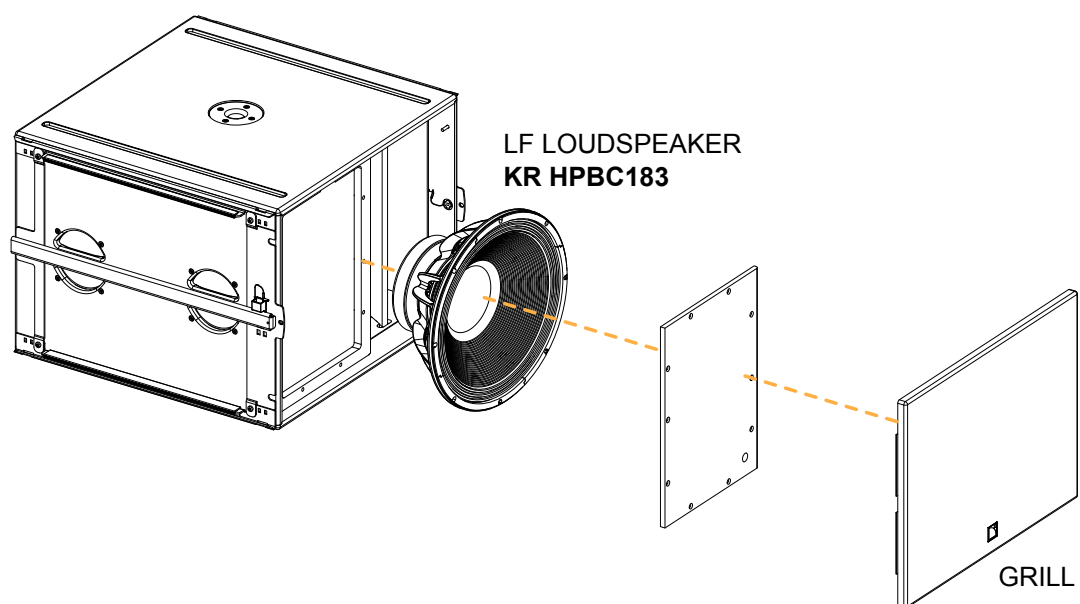
4. Secure the protective cover with the five screws.



SB18m

Exploded view

In order to operate, follow the order outlined here.



D/R - GRILL

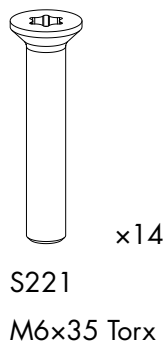
Tools

- torque screwdriver
- T30 Torx bit

Repair kit

KR HPBC183

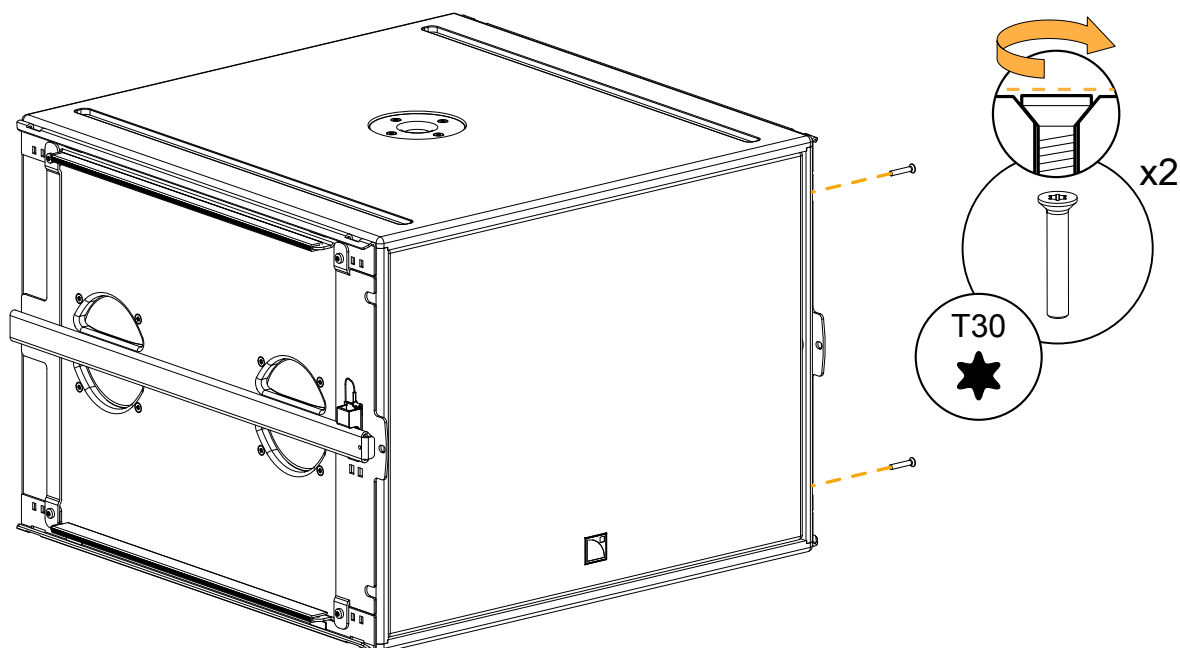
Kit HP BC183 speaker 18" - 8 ohms



Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.



D/R - LF LOUDSPEAKER

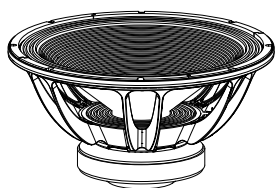
Tools

- torque screwdriver
- T30 Torx bit
- 5 mm hex bit

Repair kit

KR HPBC183

Kit HP BC183 speaker 18" - 8 ohms



x1

1073

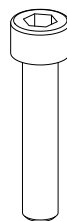
18" subwoofer speaker - 8 ohms



x4

1276

18" speaker gasket



x8

S100054

M6x30 hex



x14

S221

M6x35 Torx

Prerequisite

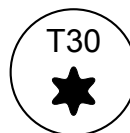
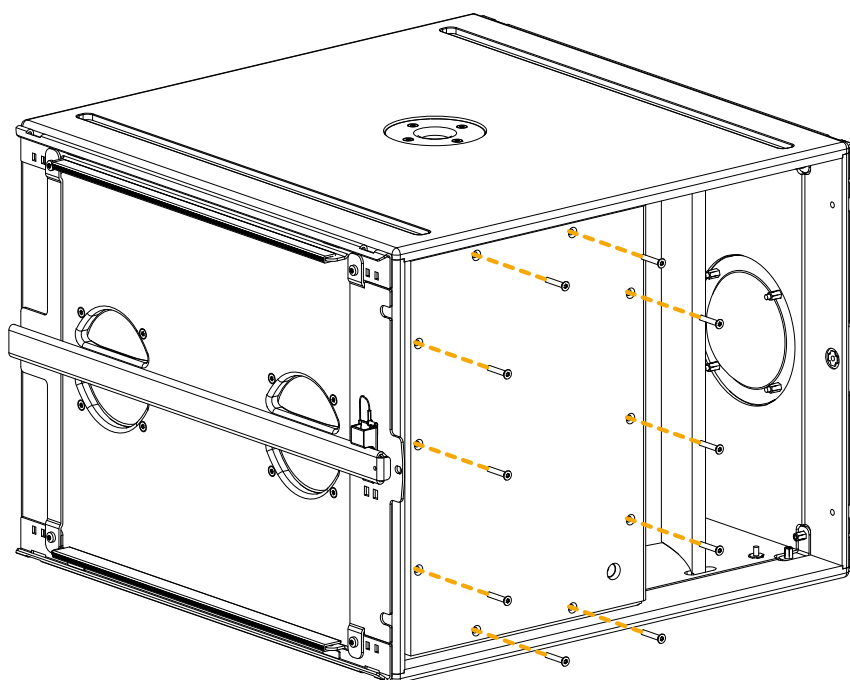
Grill disassembled.

See [GRILL](#) (p.45).

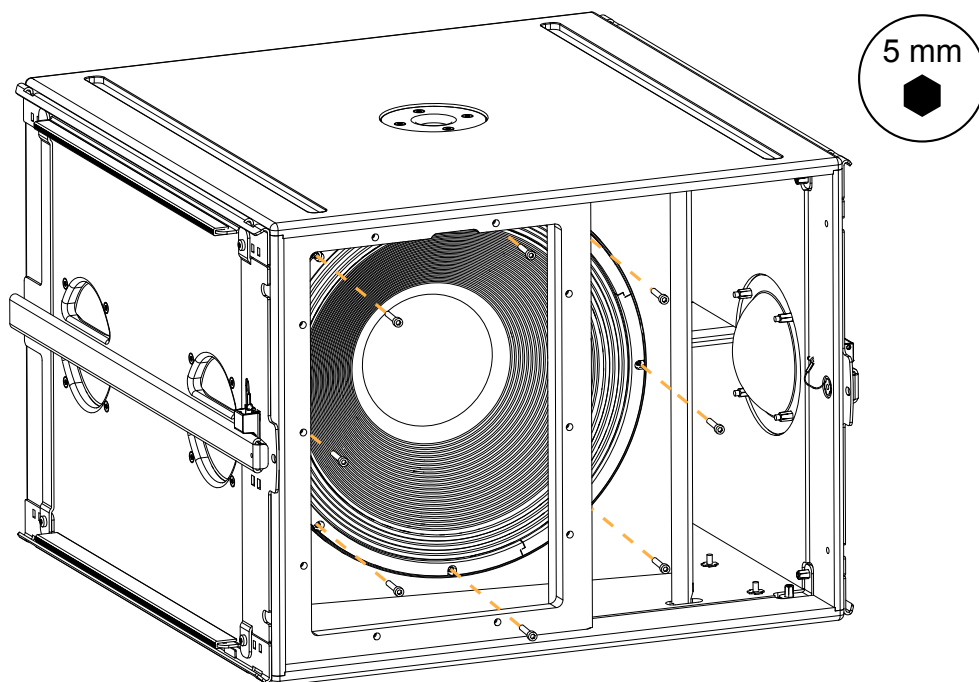
Disassembly

Procedure

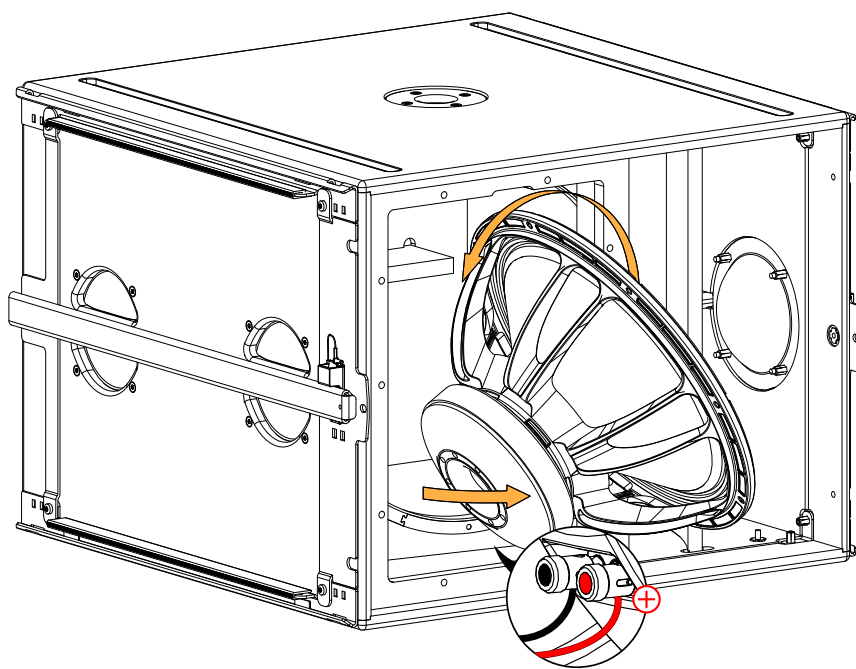
1. Remove the screws securing the plate.



2. Remove the loudspeaker screws.



3. Remove the loudspeaker from the enclosure and disconnect the loudspeaker cables.



Reassembly

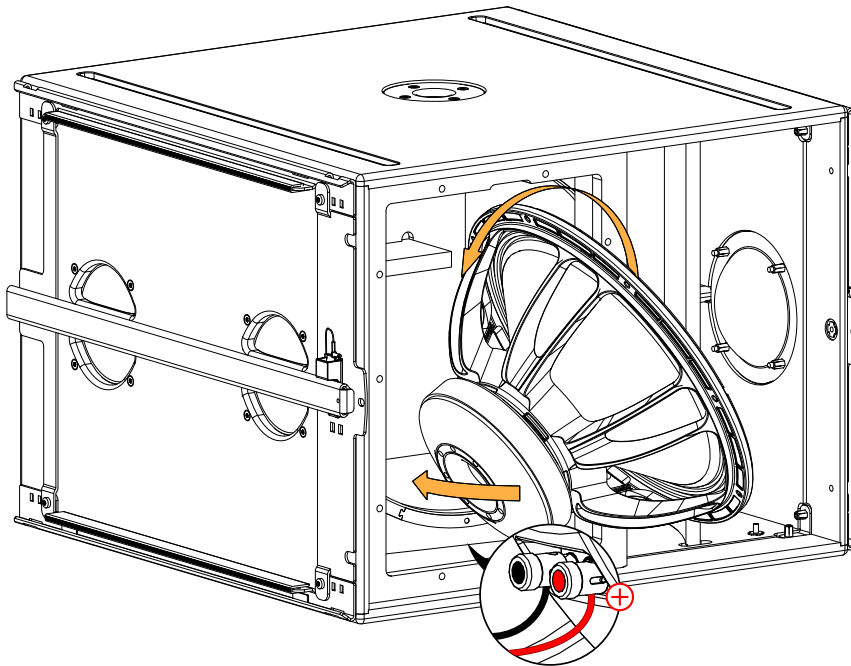
About this task



For safety reasons, always use the new screws and spare parts provided in the KR.

Procedure

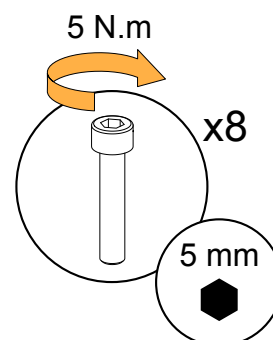
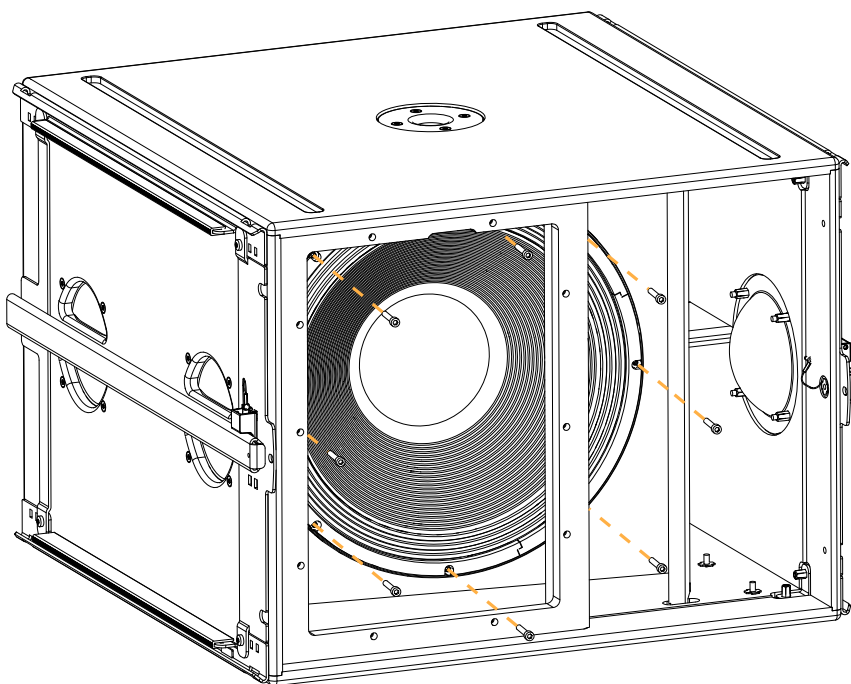
1. Stick the gasket on the cabinet.
2. Connect the loudspeaker cables and position the loudspeaker in the enclosure.

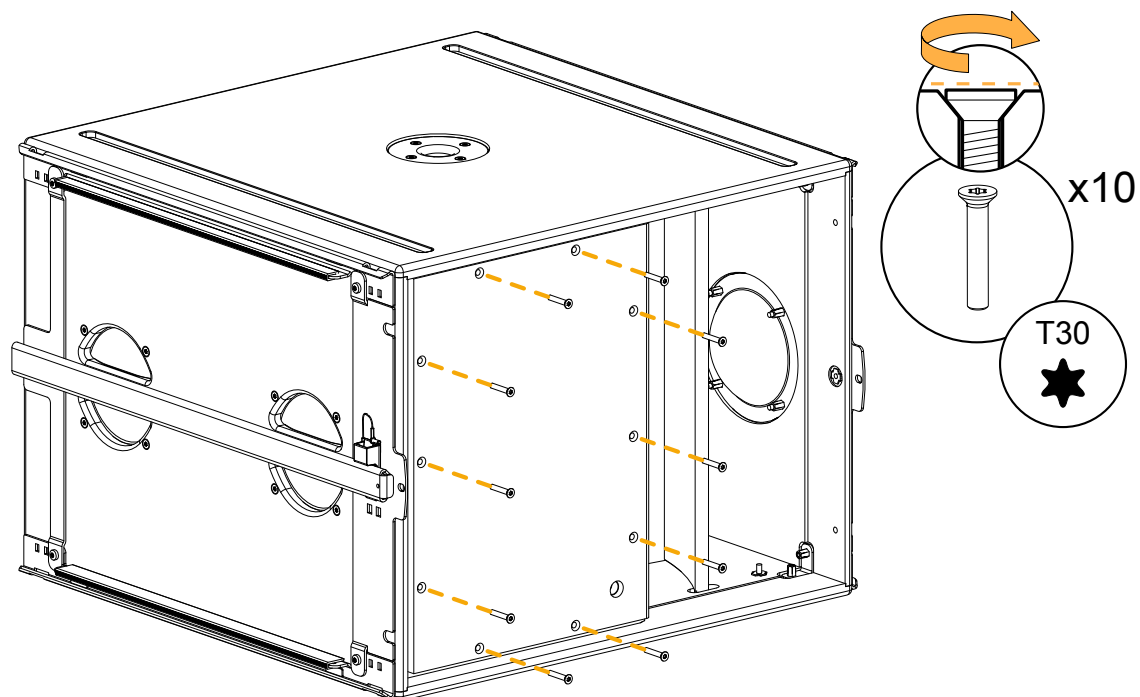


3. Secure the loudspeaker.



Tighten the screws following a star pattern.

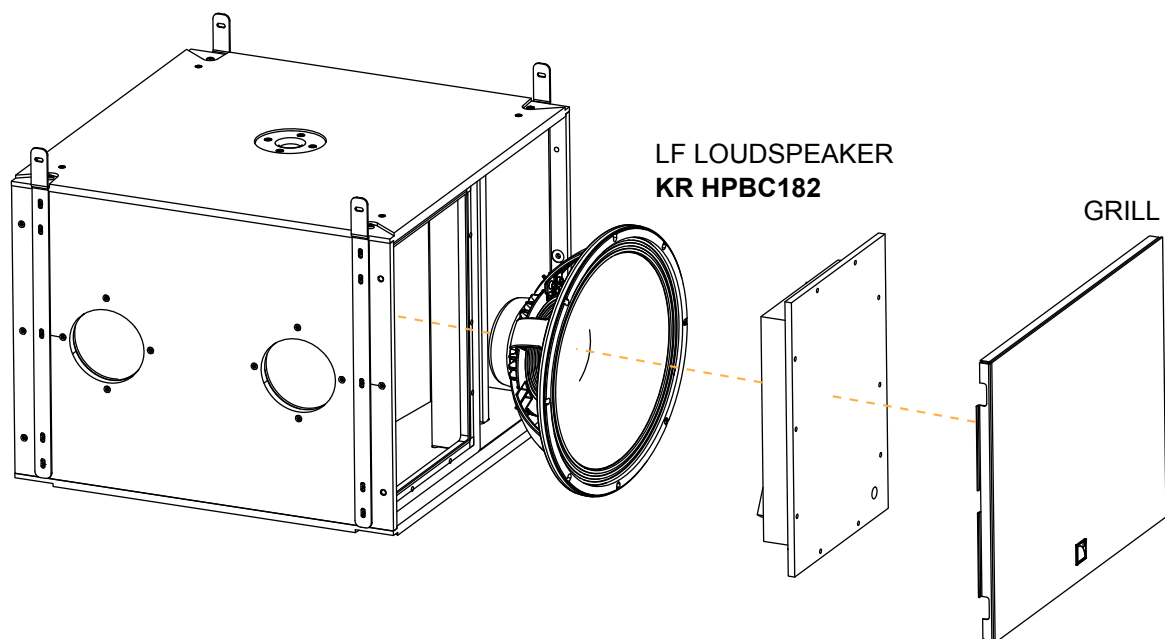


4. Secure the plate.

SB18i

Exploded view

In order to operate, follow the order outlined here.



D/R - GRILL

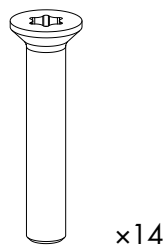
Tools

- torque screwdriver
- T30 Torx bit

Replair kit

KR HPBC182

Kit HP BC182 Speaker 18" - 8 ohms



x14

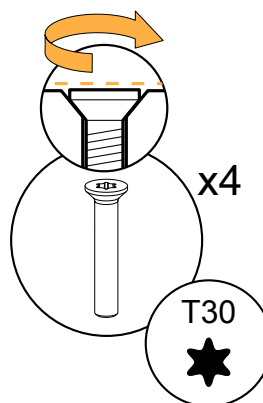
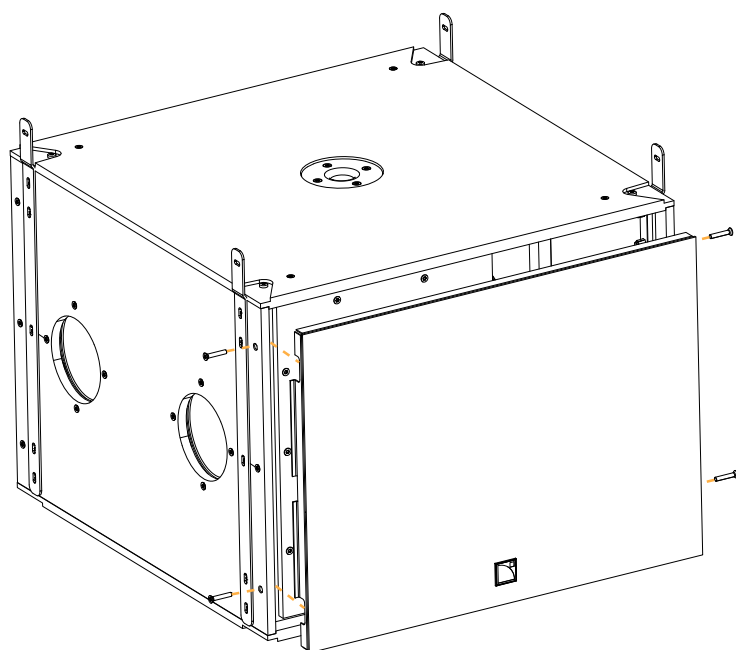
S221

M6x35 Torx

Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.



D/R - LF LOUDSPEAKER

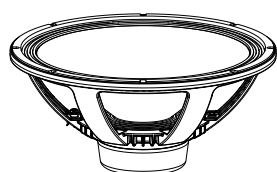
Tools

- torque screwdriver
- T30 Torx bit
- 5 mm hex bit
- blue threadlocker

Repair kit

KR HPBC182

Kit HP BC182 Speaker 18" - 8 ohms



x1

627

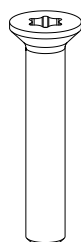
18" speaker - 8 ohms



x8

S100054

M6x30 hex



x14

S221

M6x35 Torx



x2

-

speaker gasket kit

Prerequisite

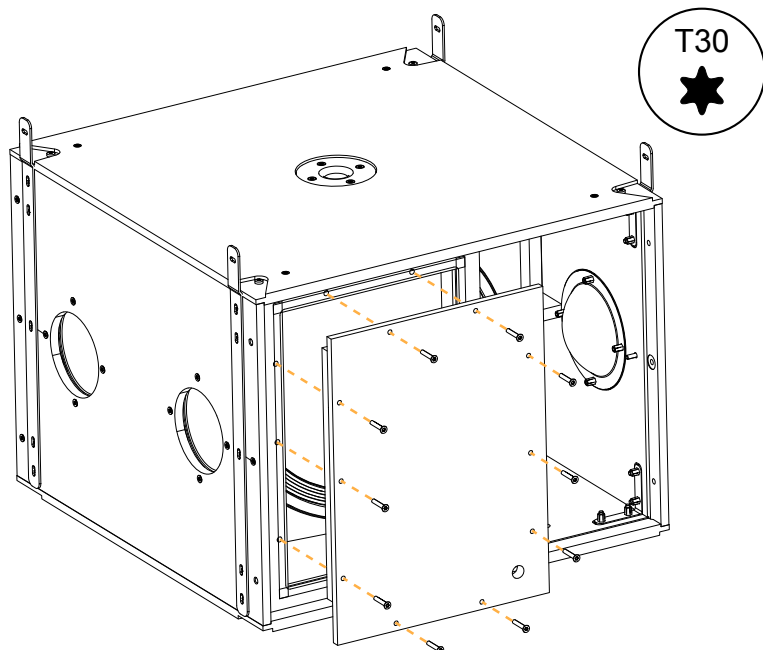
Grill disassembled.

See [GRILL](#) (p.61).

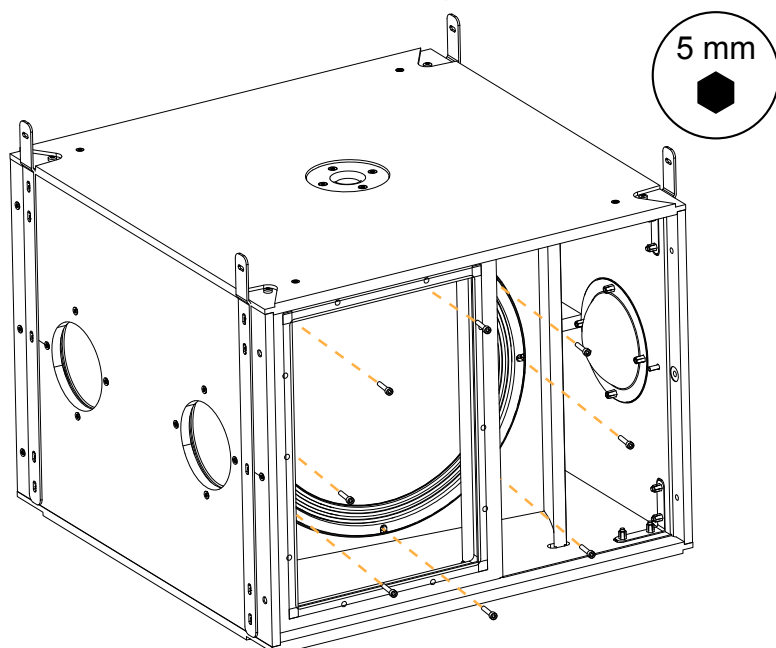
Disassembly

Procedure

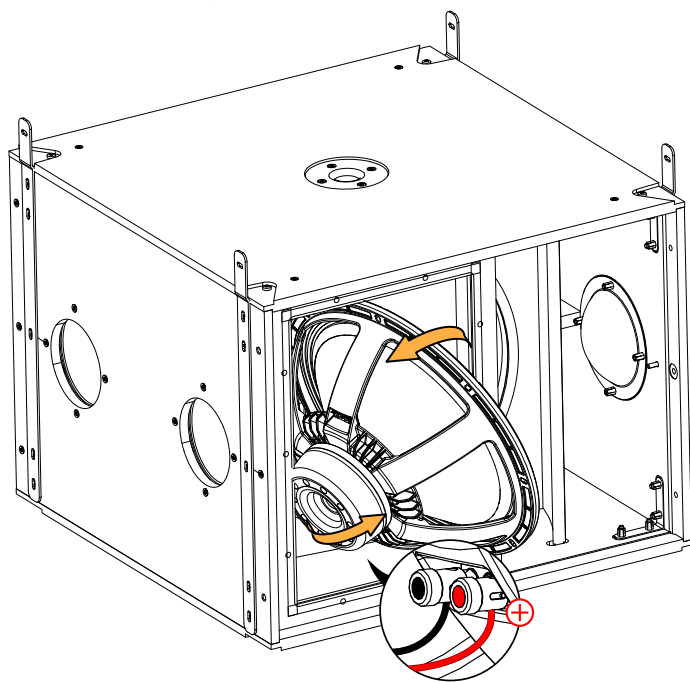
1. Remove the plate.



- 2.** Remove the screws securing the loudspeaker.



- 3.** Remove the loudspeaker from the enclosure and disconnect the loudspeaker cables.



Reassembly

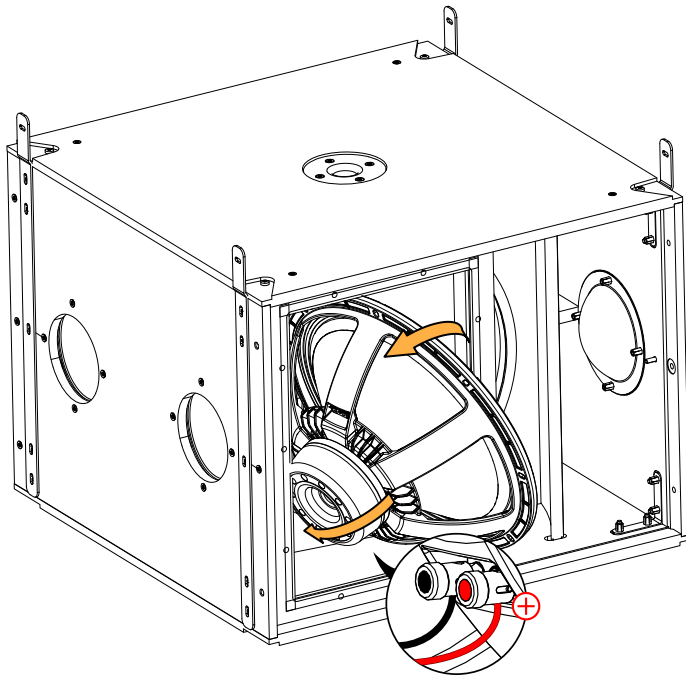
About this task



For safety reasons, always use the new screws and spare parts provided in the KR.

Procedure

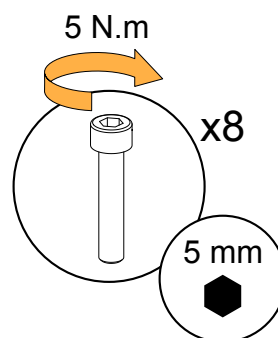
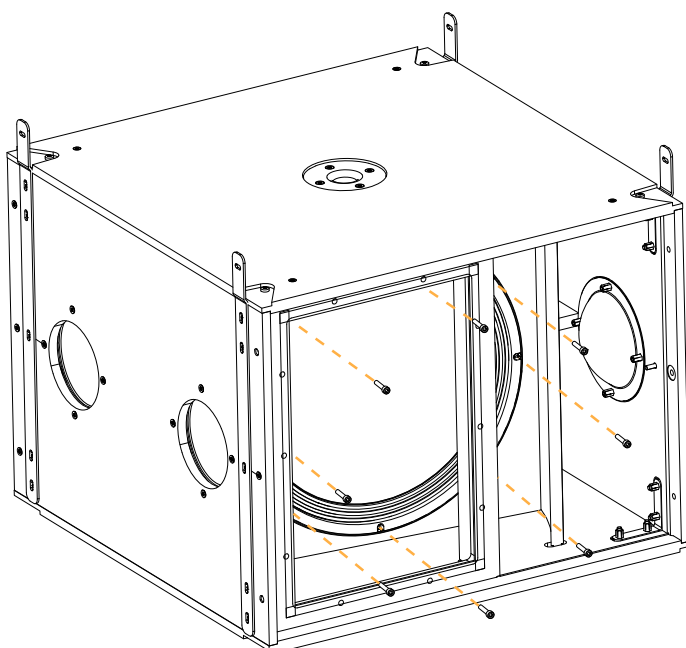
1. Stick the gasket on the cabinet.
2. Connect the loudspeaker cables and position the loudspeaker in the enclosure.




3. Secure the loudspeaker.

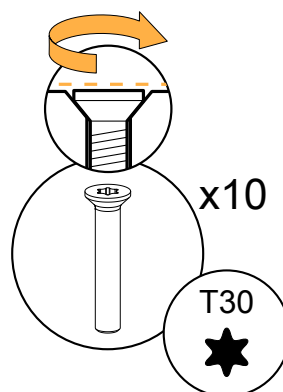
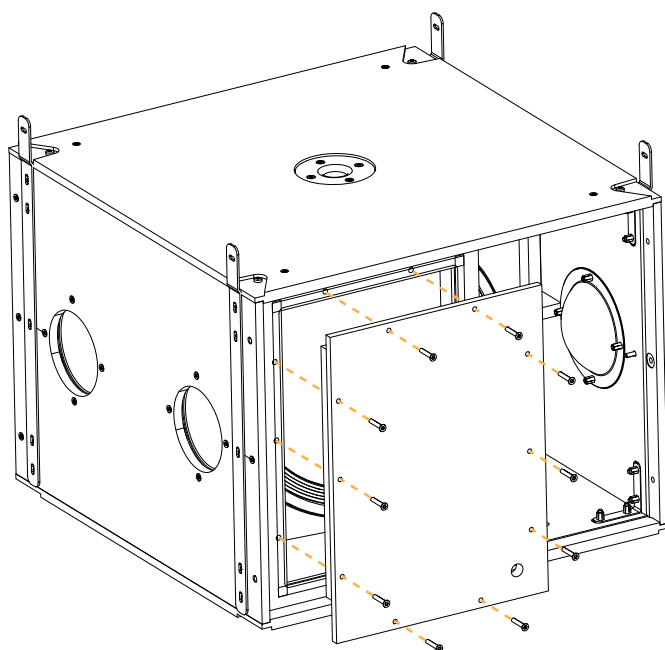


Gradually tighten the screws following a star pattern.



4. Secure the plate.

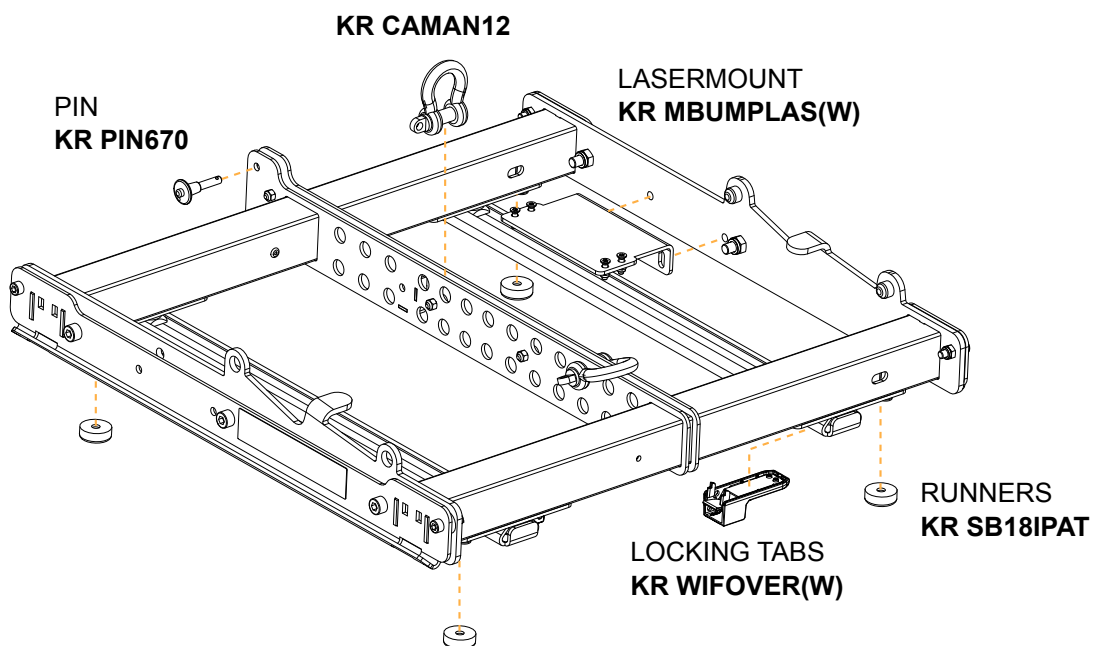
 Gradually tighten the screws following a star pattern.



KIBU-SB

Exploded view

In order to operate, follow the order outlined here. Each assembly refers to the corresponding D/R procedure and the necessary repair kit(s).



D/R - Lasermount

Tools

- torque screwdriver
- T20 Torx bit
- 5 mm hex bit
- 7 mm hex socket
- 10 mm hex socket

Repair kits

KR MBUMPLAS

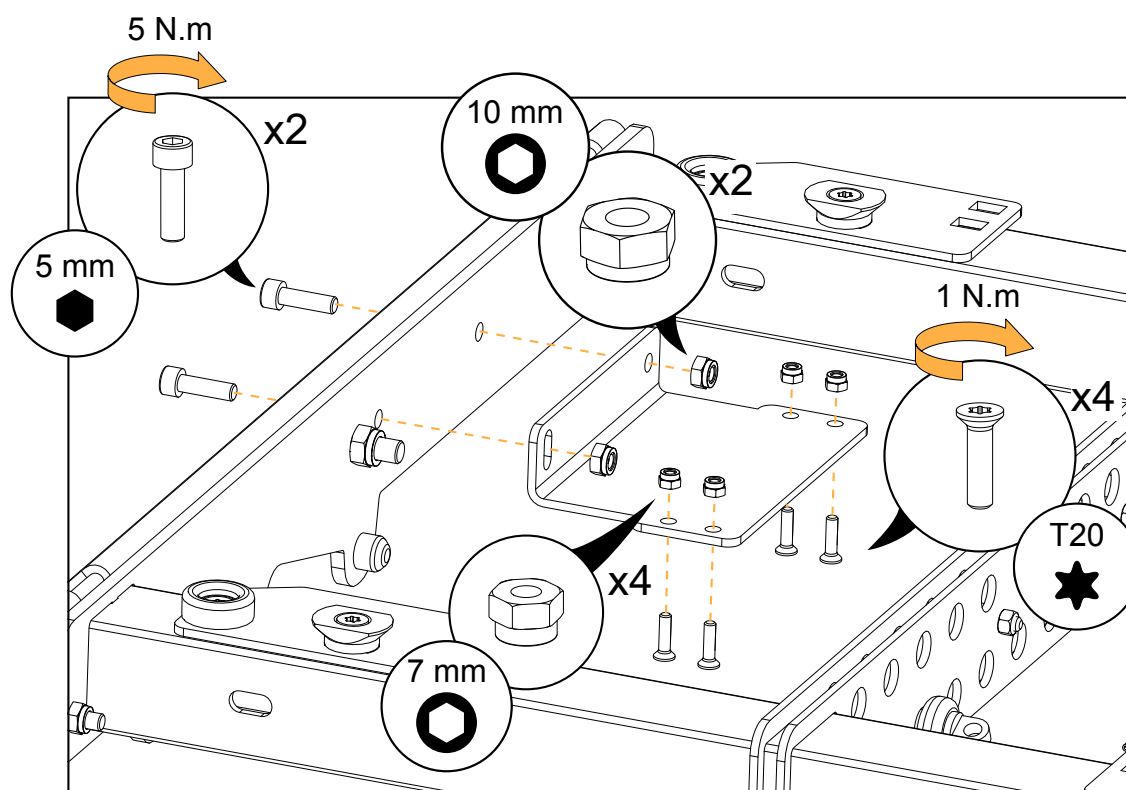
Kit laser mount for MBUMP



Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.



D/R - Runners

Tools

- torque screwdriver
- T30 Torx bit

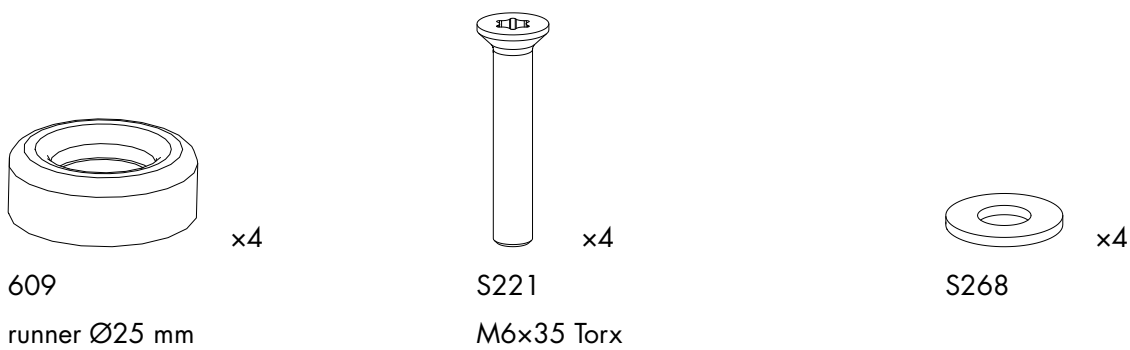
Consumables

- blue threadlocker

Repair kits

KR SB18IPAT

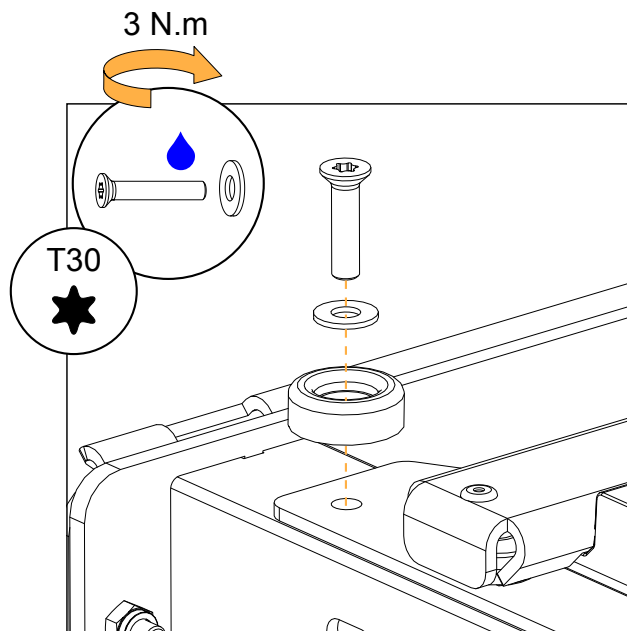
Kit SB18i 4 pads



Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.



D/R - Locking tabs

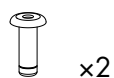
Tools

- riveting pliers

Repair kits

KR WIFOVER

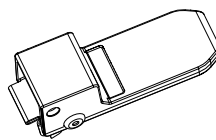
Kit 2 locking tabs with slings



x2

S142

M4x10 rivet



x2

G1734

locking tab (with lanyard)

Prerequisite

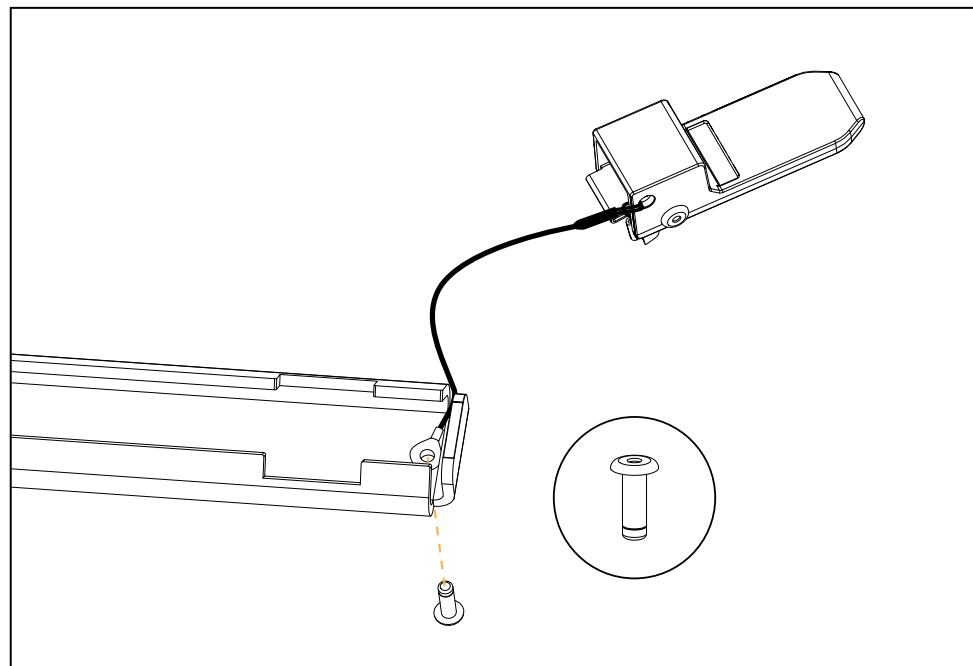
Coupling bar removed.

Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.

Pop the rivet from the outside of the coupling bar.



D/R - Pin

Tools

- riveting pliers

Repair kits

KR PIN670

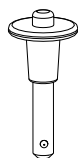
KR ball-locking pin KIBU/KIBU II



x1

S142

M4x10 rivet



x1

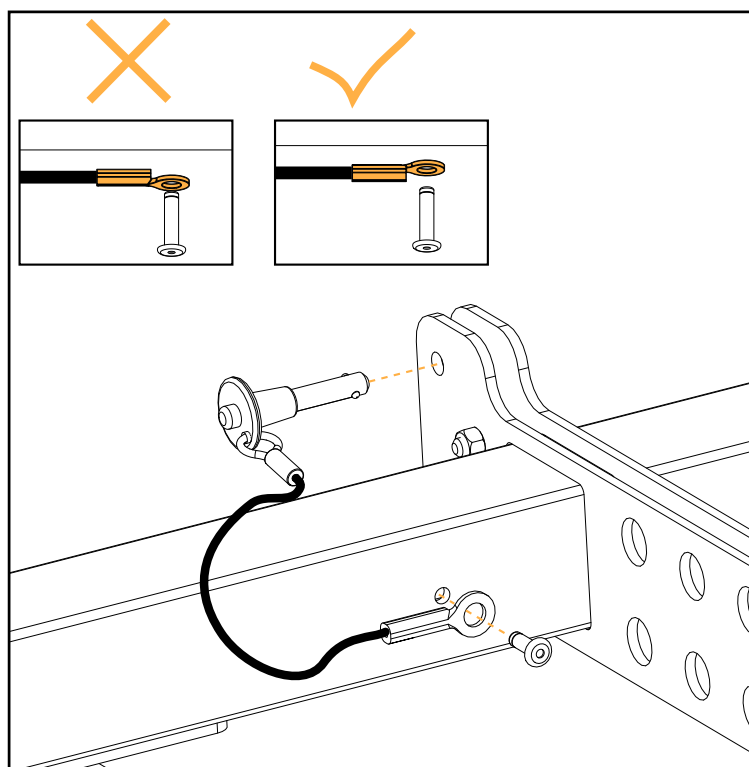
470

ball-locking pin (with lanyard)

Exploded view



For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.



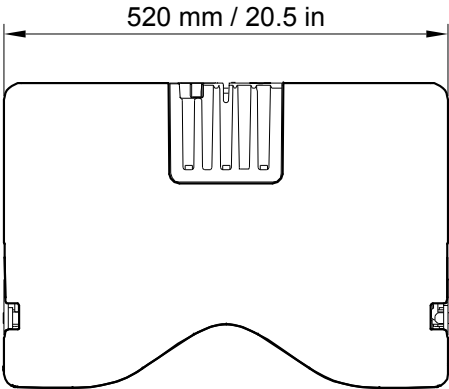
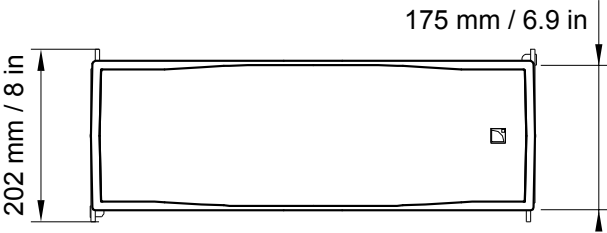
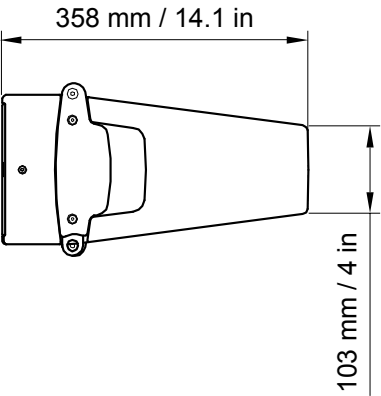
Specifications

Kiva specifications

Description	2-way passive ultra compact WST® enclosure, amplified by LA4X / LA8 / LA12X
Usable bandwidth (-10 dB)	80 Hz - 20 kHz ([KIVA])
Maximum SPL¹	132 dB ([KIVA])
Nominal directivity	vertical: depending on the number of elements and array curvature horizontal: 100°
Transducers	LF: 2 × 6.5" cone driver HF: 1 × 1.5" diaphragm compression driver
Acoustical load	LF: bass-reflex enclosure HF: DOSC waveguide, L-Fins
Nominal impedance	8 Ω
Connectors	IN: 1 × 4-point speakON LINK: 1 × 4-point speakON
Rigging and handling	flush-fitting three-point rigging system inter-enclosure angles: 0°, 1°, 2°, 3°, 4°, 5°, 7.5°, 10°, 12.5° and 15°
Weight (net)	13 kg / 28.7 lb
Cabinet	composite sandwich structure
Front	composite grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	high grade steel
Finish	dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order

¹ Peak level at 1 m under free field conditions using pink noise with crest factor 4 (preset specified in brackets).

Kiva dimensions

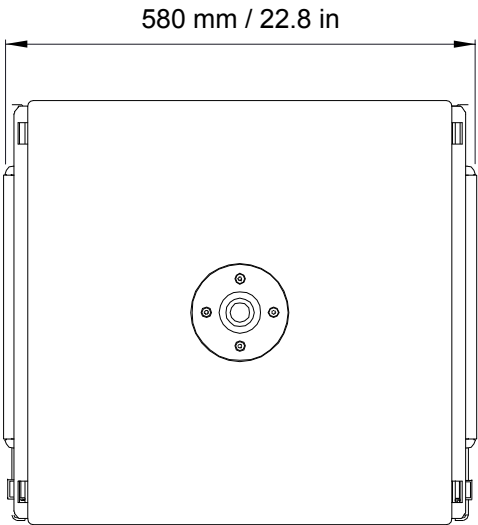
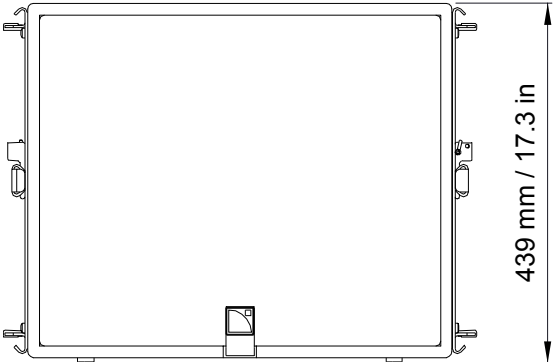
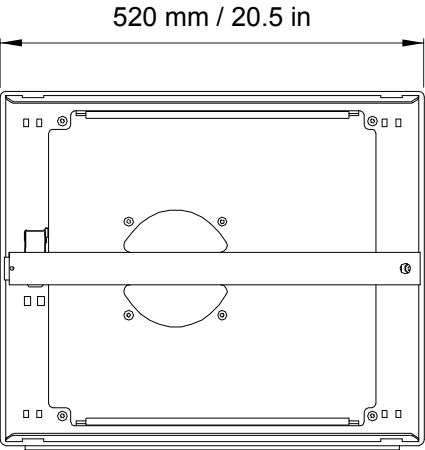


SB15m

Description	High power compact subwoofer : 1 x 15" , amplified by LA4X / LA8 / LA12X
Low frequency limit	40 Hz ([SB15_100])
Maximum SPL¹	137 dB ([SB15_100])
Directivity	standard or cardioid
Transducers	1 x 15"
Acoustical load	bass-reflex enclosure, L-Vents
Nominal impedance	8 Ω
Connectors	IN: 4-point speakON LINK: 4-point speakON
Rigging and handling	2 handles 2 coupling bars and 2 locking tabs 1 x 35 mm pole socket
Weight (net)	36 kg / 79.4 lb
Cabinet	first grade Baltic birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	high grade steel with anti-corrosion coating
Finish	dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order
IP	IP45

¹ Peak level at 1 m under half space conditions using pink noise with crest factor 4 (preset specified in brackets).

SB15m dimensions

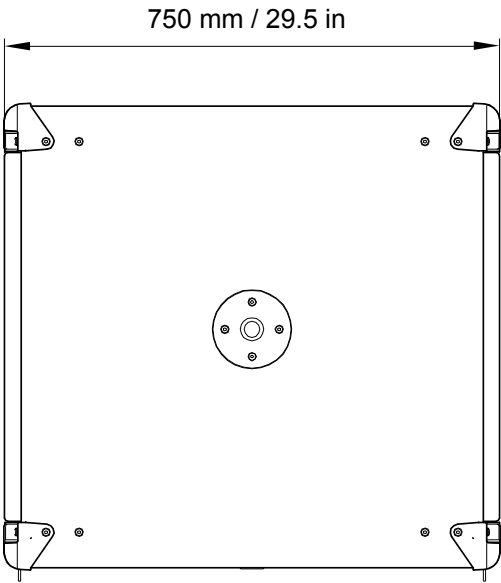
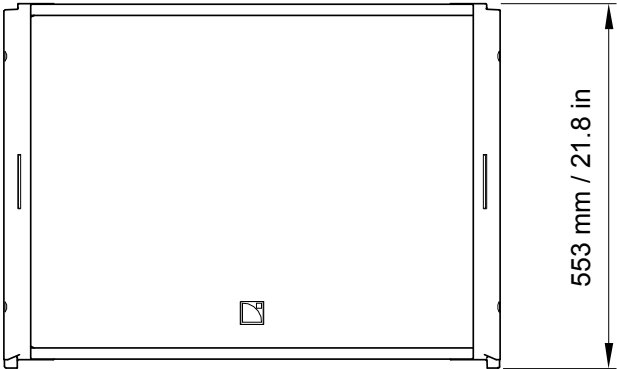
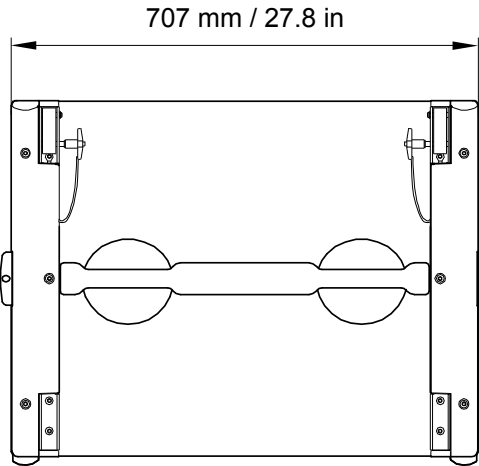


SB18 specifications

Description	High power compact subwoofer: 1 x 18" , amplified by LA4X / LA8 / LA12X
Low frequency limit (-10 dB)	32 Hz ([SB18_100])
Maximum SPL¹	138 dB ([SB18_100])
Nominal directivity	standard or cardioid
Transducers	1 x 18"
Acoustical load	dual bass-reflex, L-Vents
Nominal impedance	8 Ω
Connectors	IN: 1 x 4-point speakON LINK: 1 x 4-point speakON
Rigging and handling	2 handles integrated into the cabinet captive rigging system 1 x 35 mm pole socket
Weight (net)	52 kg / 115 lb
Cabinet	first grade Baltic birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	steel with anti-corrosion coating
Finish	dark grey brown Pantone 426C
IP	IP55

¹ Peak level at 1 m under half space conditions using pink noise with crest factor 4 (preset specified in brackets).

SB18 dimensions

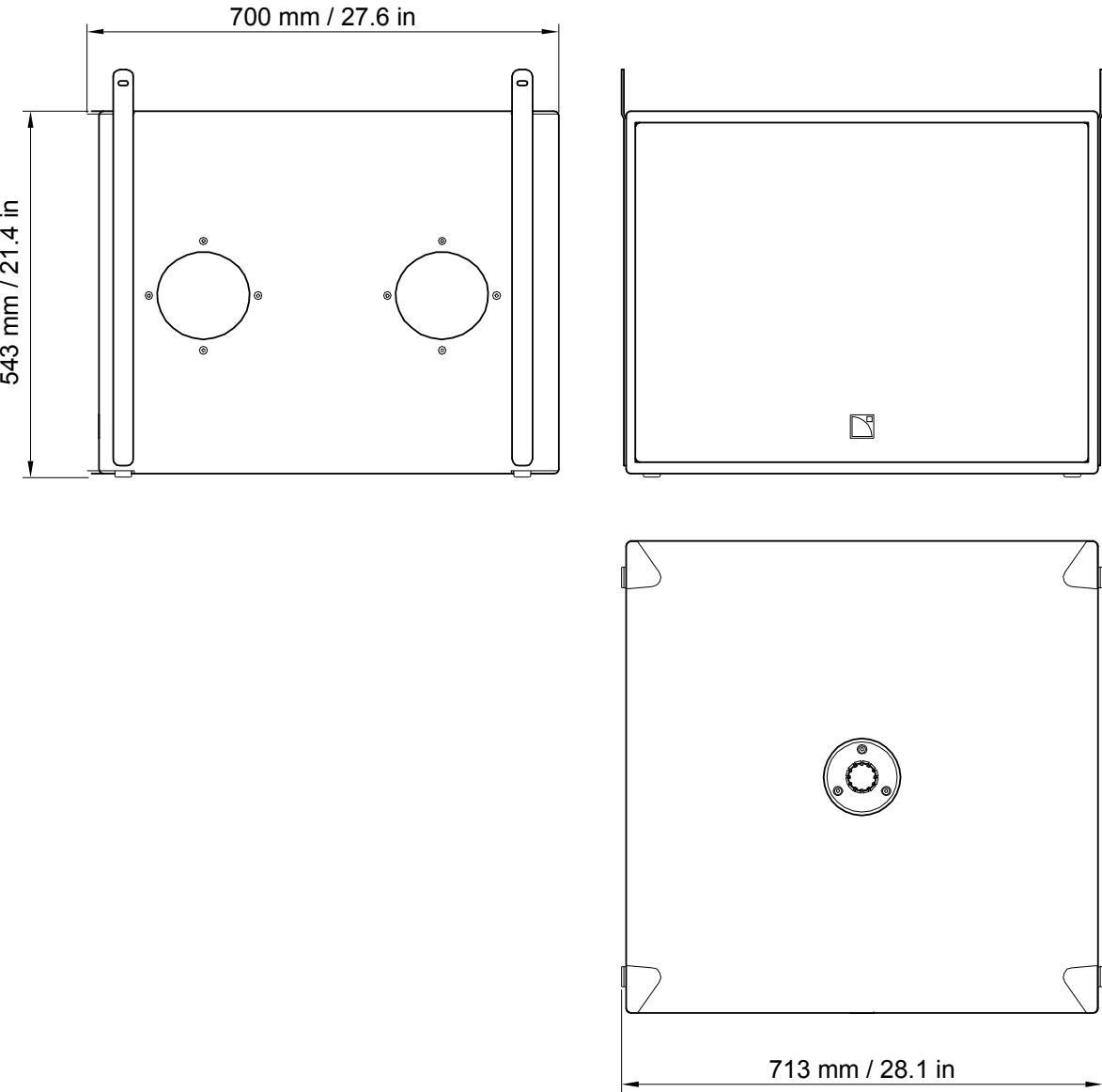


SB18i

Description	High power compact subwoofer: 1 x 18" installation version, amplified by LA4X / LA8 / LA12X
Low frequency limit	32 Hz ([SB18_100])
Maximum SPL¹	138 dB ([SB18_100])
Directivity	standard or cardioid
Transducers	1 x 18" cone driver
Acoustical load	dual bass-reflex, L-Vents
Nominal impedance	8 Ω
Connectors	IN: 1 x 4-point speakON LINK: 1 x 4-point speakON
Rigging and handling	captive rigging system 2 handles integrated into the cabinet 1 x 35 mm pole socket
Weight (net)	50 kg / 110 lb
Cabinet	first grade Baltic birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	steel with anti-corrosion coating
Finish	dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order
IP	IP55

¹ Peak level at 1 m under half space conditions using pink noise with crest factor 4 (preset specified in brackets).

SB18i dimensions

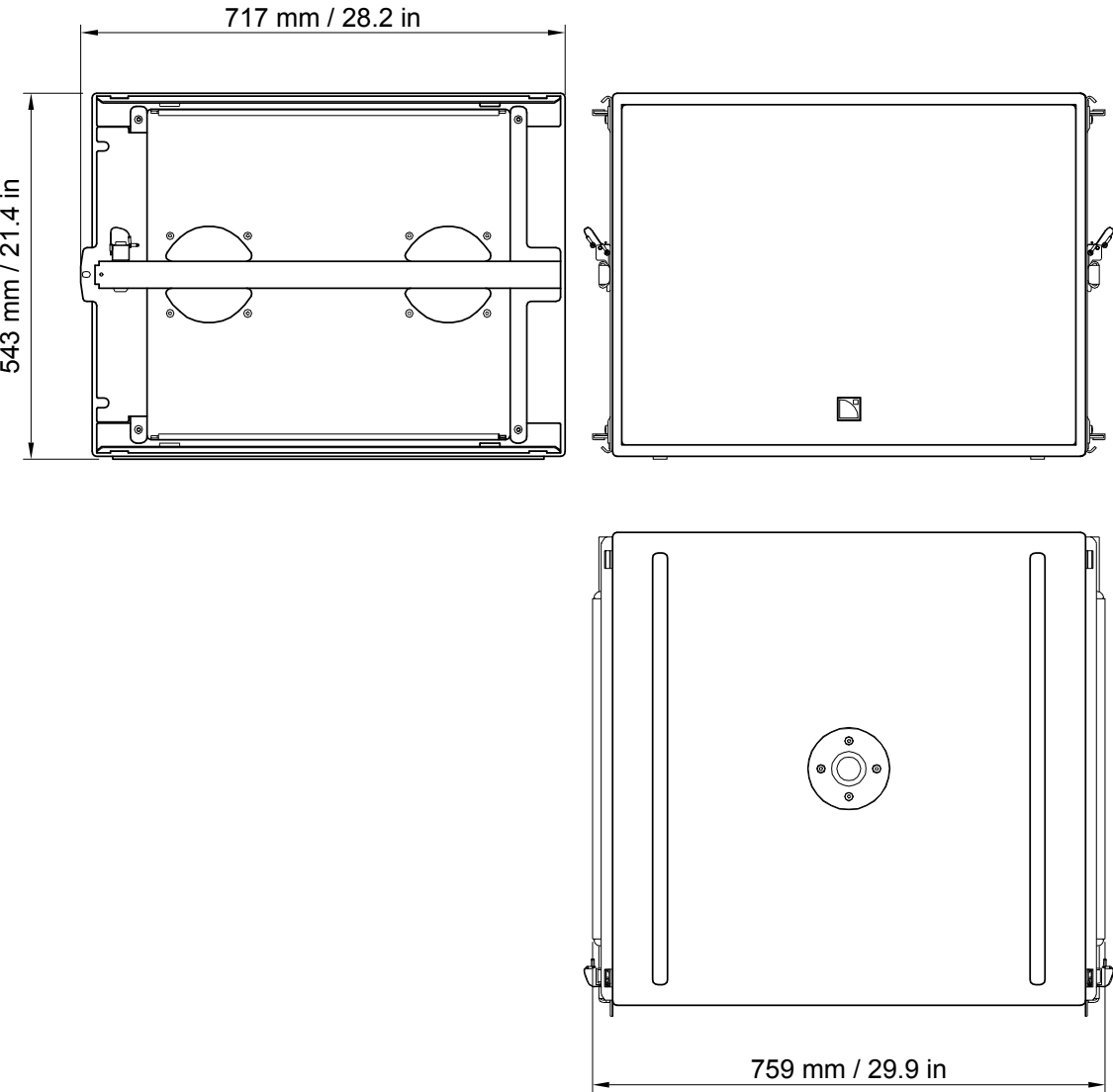


SB18m specifications

Description	High power compact subwoofer: 1 x 18" , amplified by LA4X / LA8 / LA12X
Low frequency limit	32 Hz ([SB18_100])
Maximum SPL¹	138 dB ([SB18_100])
Directivity	standard or cardioid
Transducers	1 x 18" cone driver
Acoustical load	L-Vents, dual bass-reflex
Nominal impedance	8 Ω
Connectors	IN: 1 x 4-point speakON LINK: 1 x 4-point speakON
Rigging and handling	2 coupling bars and 2 locking tabs 2 handles integrated into the cabinet 1 x 35 mm pole socket 2 ground runners
Weight (net)	62 kg / 137 lb
Cabinet	first grade Baltic birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	high grade steel with anti-corrosion coating
Finish	dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order
IP	IP55

¹ Peak level at 1 m under half space conditions using pink noise with crest factor 4 (preset specified in brackets).

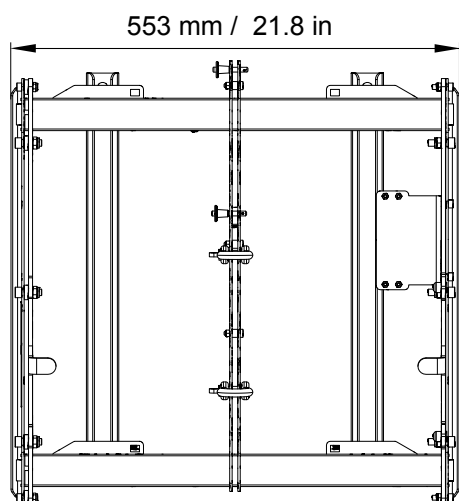
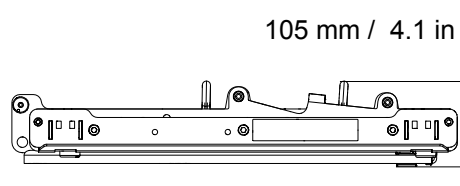
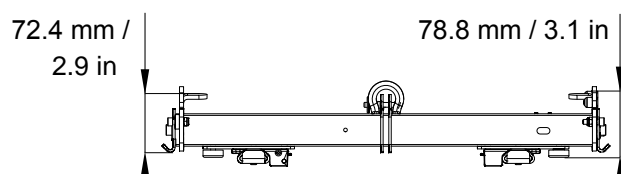
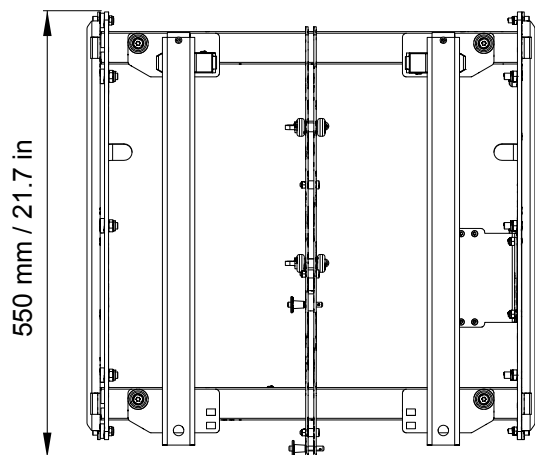
SB18m dimensions



KIBU-SB specifications

Description	Rigging frame for flying or stacking KIVA II/KIVA and SB15m 2 x Ø12 mm shackles WLL 1 t
Weight (net)	10.7 kg / 23.6 lb
Material	high grade steel with anti-corrosion coating

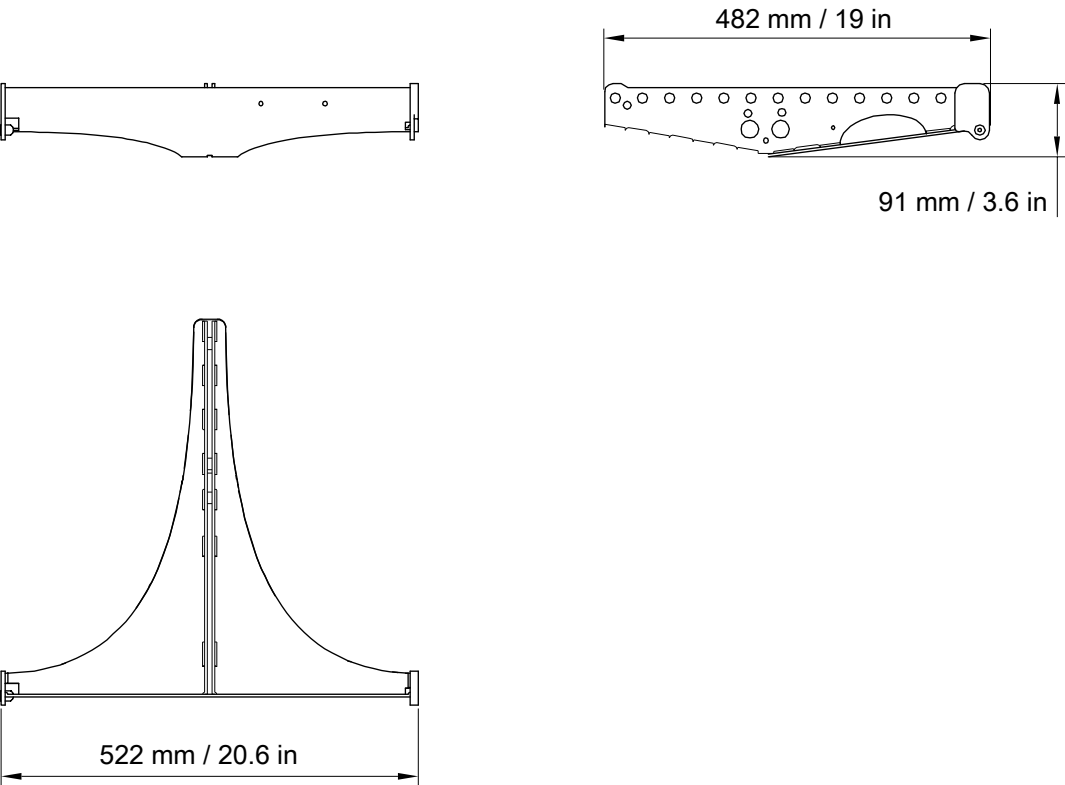
KIBU-SB dimensions



KIBU specifications

Description	Rigging & stacking element for KIVA 2 × Ø12 mm shackles WLL 1 t
Weight (net)	4 kg / 8.8 lb
Material	high grade steel with anti-corrosion coating

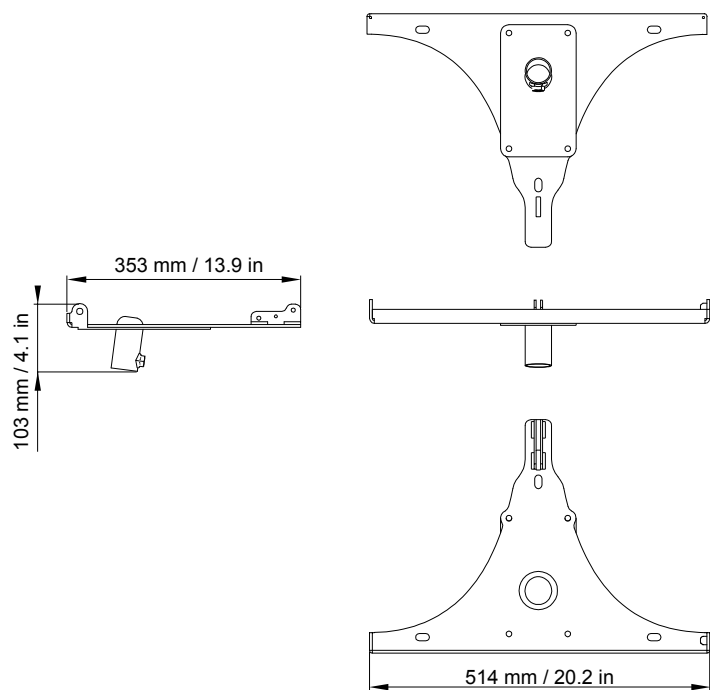
KIBU dimensions



KIET specifications

Description	Rigging element for a maximum of 2 KIVA (ceiling or pole-mount)
Weight (net)	3 kg / 6.6 lb
Material	high grade steel with anti-corrosion coating

KIET dimensions



Installing an inclinometer on KIBU-SB

Tools

- torque screwdriver
- T20 Torx bit
- 7 mm wrench

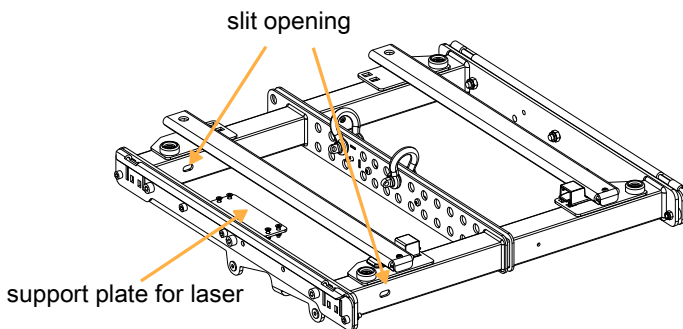
About this task

KIBU-SB is equipped with a support plate for installing an optional inclinometer. Three models are compatible: TEQSAS® LAP-TEQ PLUS (provided in the **TECH TOOLCASE**), TEQSAS® LAP-TEQ (legacy model), and KSG® RECLINE Compact.



LAP-TEQ / LAP-TEQ PLUS sensor and display compatibility

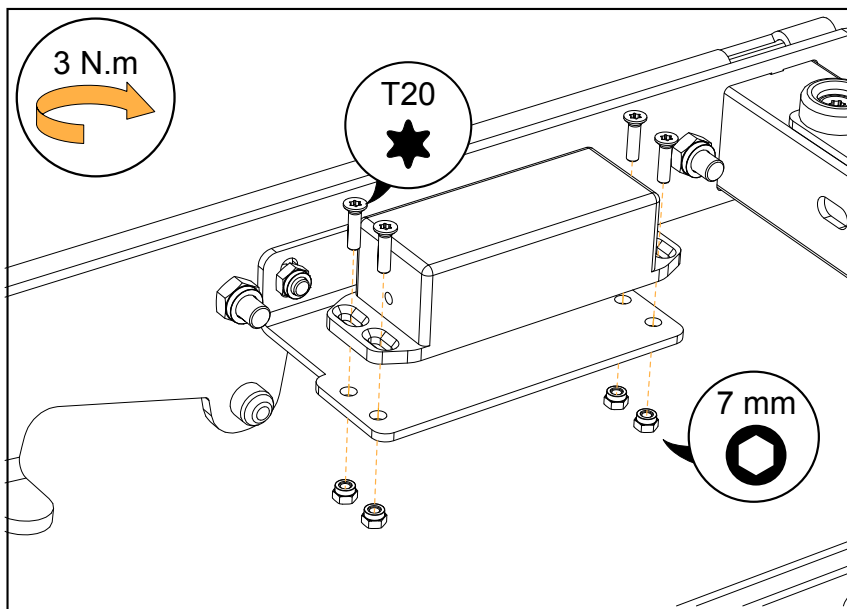
The legacy LAP-TEQ sensors are compatible with the new TEQSAS® LAP-TEQ PLUS displays. Conversely, the new sensors are **not** compatible with the legacy displays.



Exploded view

Use the screws and nuts provided with KIBU-SB.

Before tightening the screws, align the laser with the slit opening.



LAP-TEQ mounted on KIBU-SB.

Recommendation for speaker cables

Follow the recommended maximum length for loudspeaker cables to ensure minimal SPL attenuation.



Cable quality and resistance

Only use high-quality fully insulated speaker cables made of stranded copper wire.

Use cables with a gauge offering low resistance per unit length and keep the cables as short as possible.

The table below provides the recommended maximum length for loudspeaker cables depending on the cable gauge and on the impedance load connected to the amplifier.

cable gauge			recommended maximum length					
			8 Ω load		4 Ω load		2.7 Ω load	
mm ²	SWG	AWG	m	ft	m	ft	m	ft
2.5	15	13	30	100	15	50	10	33
4	13	11	50	160	25	80	17	53
6	11	9	74	240	37	120	25	80

For your installation projects, you can use the more detailed L-ACOUSTICS calculation tool to evaluate cable length and gauge based on the type and number of enclosures connected. The calculation tool is available on our website:

<http://www.l-acoustics.com/installation-outils-de-calcul-137.html>



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